The Builder.

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THE failure of the cast-iron girder-bridge at Chester, and its frightful consequences, cannot fail to cause much anxiety to every man engaged in construction, whether director or operative. Planned by one of the first engineers of the day, executed *without regard to cost*, the girders tested singly (at least so say the witnesses), the structure in use ever since *November last*, and yet on the instant, without a moment's warning, failure takes place, the whole is a ruin,—and property, and human life, and the happiness, perhaps welfare, of surviving relatives are sacrificed.

If security cannot be obtained with certainty under the circumstances attending the erection of this and similar constructions, how can it be looked for in those buildings where, cheapness being of necessity studied, the devisers and contractors are cramped and confined, and the *just enough* is all that is proposed: where the inquiry is, how little will do? and provision against extraordinary accidents cannot be considered.

A very rigorous inquiry into the cause of the failure which is now agitating the public is the first thing necessary. Is it to be looked for in the foundation, the masonry, or the iron? At present opinions vary considerably, but we have little doubt in our own minds that it will be found in the latter. Was the design of the girder a good one, and sufficient for the largeness of the span,—nearly 100 feet? How was the casting conducted? and, in short, where does the blame, if any, rest? Efforts will of course be made to shift it, but the public safety demands that it should be *correctly* arrived at. For some time past, as we happen to know, an impression has prevailed in the neighbourhood of the bridge that it was unsafe; the grounds for this impression will probably appear during the inquiry which is now going on, and in which many able men are engaged. In addition to those mentioned in our last, Captain Simmons, of the Engineers, and Mr. James Walker, have been sent down by the Railway Board, and Major Foster is watching the proceedings on the part of the Admiralty. General Pasley is also there, and Messrs. Locke, Vignolles, and other engineers.

Before making any further observations, we proceed to lay before our readers such portions of the evidence already given, as bear most strongly on the questions wherein we are more particularly interested.

The engine driver proved that the speed at which the train was travelling when it reached the bridge was about 15 to 20 miles an hour. He had been on the line about six months, and had never felt any particular vibration or subsidence when passing over this bridge.

Sir E. S. Walker, acting as foreman of the jury, said that reports had described the deflection of the bridge to be at times as much as from 3 to 6 inches. The jury wished that a pole should be fixed under one of the arches with a painted top, and a train passed over, so as to ascertain its precise state. This was promised.

Thomas Frith, who was fishing in the Dee, within a 100 yards of the bridge, when the accident occurred, saw a large piece of the iron girder fall from the middle buttress, and the train follow amidst a heap of stone and rubbish. He had been under the bridge on the same day, when a previous train was going over, and then saw *the same iron girder bend, which afterwards broke*.

Mr. Thomas Alfred Yarrow, who was selected by the coroner and jury to examine the bridge, said:—

I have been a civil engineer for the last 12 years. I have held the appointment of bridge-master for Chester for some time, and have no connection at present with any railway. I have made the construction of bridges my entire study. I have made an examination of the railway bridge over the Dee, and I now read my report of the inspection:—"Upon examining the bridge, I found that the masonry and ironwork, with the exception of that part of each which has fallen, were in an apparently sound state. The principle of the bridge is that of trussed girders of cast metal resting upon stone piers and abutments, which are parallel to the course of the river, but askew to the railway above. Each girder consists of three pieces, having vertical flanges, with bolts at the joints, and, in addition to being bolted to the full depth of the girder, each joint is surmounted by a segmental piece, to receive which, notches have been cast in the upper surface of the girders. The tension rods descend in an oblique direction to each joint, and are carried horizontally between them; they consist of separate bars of wrought iron, which are secured to each other laterally by clips. The portion of the bridge which has fallen consists of one outside girder on the Salteney side of the river, with the attached platform and transverse tension rods. Two stones, composing part of the string course, and acting as a bed for the girder on the Salteney abutment have fallen, and also the corner stone at the acute angle of the opposite river pier upon which the broken girder rested. The girder itself is broken, having two fractures in the length near to the Salteney abutment, and one in its centre. Having premised this short description of the construction of the bridge, and its present appearance, I may proceed to detail the facts which I have remarked during my investigation, and which have enabled me to arrive at a confident conclusion as to the cause of the accident. My attention was in the first instance directed to an examination of the fractured ends of the girder, for the purpose of ascertaining whether any defect had existed in the castings. The appearance of the broken surface led me to conclude that the castings had been sound, and the tension bars, as far as they have yet been recovered from the water, are unbroken. From calculations which I have made of the strength of the girders, taken from an actual measurement of the section at the point of fracture, I find that, independent of any additional strength that may be obtained from the tension bars, the girders alone are capable of sustaining a much greater weight than could under any ordinary circumstances be placed upon them. The breaking weight of each girder I calculate at 74 tons, supposing the weight to be concentrated over one point, and of both girders 148 tons. But it is an admitted principle that a beam will carry twice the weight, distributed over its whole surface, that it will bear upon one point. We can therefore conclude, that twice the above weight, $148 + 2 = 296$ tons, is the breaking weight of one bay or opening of the bridge for one line of rails. The weight of girders and platform is, at a rough calculation, about 90 tons, which must be deducted from the foregoing quantity; we have therefore 296, less 90, equal 206 tons as the breaking weight; and this is altogether without reference to the tension bars. From the above facts, I concluded that the accident did not arise from the breaking of the girder as a primary cause, and I therefore directed my attention to the state of the masonry and to a consideration of its sustaining power. Having carefully examined all the displaced stone and their respective beds, I found that one, previously named as forming the acute angle of the river pier, and upon which one end of the broken girder rested, was totally inadequate, in its form and bearing surface, to its important situation. This stone had sustained nearly three-quarters of that portion of the flange of the girder which rested upon the pier. The area of its lower surface is 24 feet 6 inches, of which 11 feet 6 inches only was bedded on the pier, leaving 13 feet to overhang as a cornice. The stone was not connected by cramps or ties with the adjoining masonry of the pier. The railway over the whole bridge is curved. The broken girder supporting the outer side, and being subject to a greater lateral force than the girders forming the inside radius of the curve, I consider that this lateral force, acting during the passage of each train, must have so far loosened the inefficient masonry as to cause a displacement of the girder itself and its consequent fracture."

When examined, he said:—If I had had the management of the bridge I certainly should have had a greater strength of masonry round the girder. Considerable vibration would be likely to disturb the masonry. I tried the deflection of the arch opposite the third one. An engine and loaded ballast waggons, in weight about 50 tons, passed over it, and the deflection was about one inch and a third.

Mr. Robert Board, superintendent of the Mausley Iron Works.—The girders of the Chester railway bridge over the Dee were manufactured at those works. They were tested before sent to the railway. Each girder was placed side by side and tested by 50 tons of iron being put on them in the centre. We took the deflection on every five tons, but have not got the particulars of those deflections. The ordinary pressure on the girders passing over them would not exceed 50 tons. After the girders had been tested we found a flaw in one of them: it was a mere honey-cake, and it was rectified before it was sent away. I have since examined the girder, and found that the accident had not resulted from the flaw. The fractures were in the sound metal. I superintended the fixing of the girders. There are many railway bridges of the same kind. On the Trent Valley line there are eight of the kind. It is not opened to the public as yet, but on the Blackwall Railway there are several that have had heavy trains passing over them for years. The one over the Dee is the largest. I never heard of any of them giving way. Have been several times to view the bridge when trains were passing over it, and found the deflection very trivial, not much more than an inch. Have heard that it was considerable.

Mr. Tyrrell said, that as there seemed to have been a feeling that the bridge was dangerous, and as the line was leased to the Chester and Shrewsbury Railway, probably the gentleman who represented that company would state whether they had received any communication to that effect.

The coroner remarked—Most certainly the notion had prevailed for some time that the bridge was unsafe. He did not know from whence it emanated, but it was a well-known fact that many had declined to cross it. He had laboured under that impression and had not risked himself on it.

Several who were present made a statement to the same effect. Major Robe, being examined, said he had watched the construction of the bridge, and had expressed apprehensions as to its security. [We should like to know the major's reasons]. He differed from Mr. Yarrow as to the cause of the accident, and attributed it rather to the breaking of the girder than the insecurity of the masonry.*

Mr. Lee, clerk of the works of the Chester and Holyhead Railway, said—I superintended the construction of the bridge. The abutments on the Salteney side are piled for a foundation. Upon the piles were placed a strong flooring of timber, and upon that platform we built the abutment with ashlar stone facings, 10 feet in thickness; the piles are built on hard clay, and all the materials are of the

* According to the newspapers, the Rev. A. Rigg, the principal of Chester Training College, says, there are three causes for the accident:—1st, the defect in the masonry; 2nd, the peculiar vibration, brought about by accidental circumstances; the bridge, although not a suspension bridge, was a structure that would vibrate in three ways—vertically, horizontally, and also with a slight and almost inappreciable longitudinal motion; 3rd, the horizontal vibrations from the centrifugal force of the trains passing over.

soundest description. He believed the accident had been caused by a lateral blow, such a blow as the tender striking the girder might produce; but it was difficult to say. The breaking of the girder would cause the fall of masonry. Tested the deflection of the bridge before and since the accident, and found it to range from an inch to an inch and three-eighths.

At a further investigation, on Wednesday, a full report of which appears in *The Times*, three witnesses, who had been employed in painting the girders of the bridge, gave evidence that when trains went over it, the deflection was from one inch to *five inches*.

Major-General Sir Charles William Pasley, having been sworn, said:—

I was the Government Inspector-General of Railways when the Chester and Holyhead Railway was opened. I surveyed the bridge over the river Dee on the 20th of October, and reported it as safe. I compared the plans with the actual building, and examined it in such detail as I deemed necessary. It is an iron girder bridge, of three openings or spans of 98 feet each; wrought-iron tension rods are used to strengthen it. I always was of opinion, and am so still, that these tension rods are not of great use, because I consider that the expansion of wrought and cast-iron from heat differs in some degree, although not very greatly; but that iron girders being very massive and the tension bars thin and of small dimensions, the sun may act on the wrought-iron rods very considerably and less on the cast-iron girders; and, supposing them to be adjusted for a moderate temperature, the intensity of hot weather may destroy their proper proportion and do away with the benefit of the tension. I may here state that wrought-iron, when acted upon, will elongate considerably without breaking, but cast-iron will not without breaking. There have been a number of bridges of this description erected on railways in various parts of England, both before and after I held the appointment of Inspector-General of Railways, none of which, with the exception of this one, ever failed. They were not quite of the same extent, but I will allude to a cast-iron girder bridge at York, over the river Ouse, of the York and Scarboro' Railway, which has two openings of 70 feet span. The least depth of the iron girder on that bridge is 3 feet. The least depth of those on the Dee bridge is 3 feet 9 inches; and as the bridge at York and other similar bridges have stood, I concluded that this one would, as it had an extra depth. I may also mention another bridge over the Tees, at Stockton, although I have not seen it. I may vouch for what I state to be correct. It has a span of 83 feet 4 inches, and the least depth of iron is 3 feet.

Mr. R. Stephenson said it was 87 feet.

General Pasley.—I thought it was what I stated, but you may be correct. The flange on this bridge is greater than on others. I have frequently mentioned to engineers that wrought-iron tension rods would do little good. In my inspection of a cast-iron girder bridge, on the Syston and Peterborough Railway, built by Mr. Liddle, the resident engineer, I found that he had omitted tension bars, and in my report to the Earl of Clarendon I approved of the omission, and considered it a preferable construction. It appeared that Mr. Liddle could not get the tension rods in time, and therefore he built the bridge without them. Having mentioned this repeatedly to engineers, and having been given to understand that Mr. Bidder and Mr. Gooch, two gentlemen for whom I entertain much respect, have made experiments with a view of testing the strength of girders without rods, I am informed that the trial was in favour of the latter. As to the cause of the accident; — it has been stated that some time after the Shrewsbury and Chester Railway was opened, and after I had inspected it, a girder was cracked and replaced by a new girder. This circumstance, which I did not know, and which was never reported to Government, coupled with the fracture of this one, induces me to think they are not safe, and that it is the mere cast of a die between their safety and danger. They are on the verge of danger. By examining the bridge on Thursday last and to-day, I consider that the tension rods are of very little use indeed. The tension rods are connected with the girder alone, as if they were part of it. They have no independent support, and there is a difference between this bridge and Mr. Stephenson's former iron girder bridges. In all his former girder bridges there is a connexion from girder to girder, on the central pier or piers, from one end of the bridge to the other, so that when the pressure is on one girder, the other girder in the same line contributes to assist. That is the case with the one on the river Ouse at York. The horizontal portion of these bars appears to be useless. The oblique tension bars would be of use if the upper ends were fixed to some independent support to each pier, and similar independent support on each abutment, and if the standards or support over the abutments had tension bars extending inland to resist the heavy weight going over the extreme bays or openings of the bridge. There is a swing bridge over the river Wensham, at Norwich, strengthened on this principle, and which is extremely judicious. In this case I consider that the girder broke on a train passing over, added to the weight of the ballast that had been thrown on it in the course of the morning. The masonry gave way from the girder breaking, and from that cause alone. I examined the girder; and the castings seemed very good, and I believe it is generally admitted that they are good; but the girder was too weak after the ballast that was put upon it. The girder was far enough in the masonry to support it. There was quite bearing enough to render it secure. I do not think the engine driver suddenly putting on the steam would cause the engine to bound with such force as to break the girder. I saw nothing to throw the carriages off the rails on the bridge, which had strong guard rails. I should say that no girder could have withstood a deflection of 5½ inches, as stated by a witness this day. It would have broken short at once. A continued deflection of four inches must have broken it long before this occurred.

Mr. Robert Stephenson put in a written report on the accident; from which it appeared, that on the day it occurred, and only a few hours previously, he had narrowly inspected every part of the bridge, and saw nothing to indicate weakness. He had carefully examined into every circumstance connected with the disaster since, and for reasons which he gave, was satisfied that it arose from a violent blow against the girder, near to the abutment on the Salteney side, caused by the train getting off the rails. The report said:—

"It has been suggested that the unequal expansion and contraction of the girder, during great changes of temperature, might probably interfere with the uniform strength of the metal. It is impossible to deny that this circumstance does sometimes interfere with the strength of cast-iron beams, but generally this influence may be regarded as confined to castings where the thickness of the different parts vary considerably. In the present case, the form of the castings was carefully studied, and with only such small deviation from absolute uniformity in all the thicknesses of the different parts of the section, as practice has long proved to be justifiable.

With regard to the competent strength of the structure, I concur generally in the deduction drawn by Mr. Yarrow, in which I am confirmed by an extensive experience in the construction and use of similar structures, tried under circumstances that demonstrate their capabilities to meet all the ordinary contingencies of railway traffic."

When the remainder of the evidence is before us, and more accurate details of the construction of the bridge, we shall return to the subject.

At the present moment, when several iron bridges of a very peculiar construction are in progress, when cast-iron girders are being most extensively used, as well in important public and national buildings as in private houses, and a general desire seems apparent to substitute this material for wood wherever it is practicable, it is of the utmost importance that a continued series of experiments upon it should be instituted, and our knowledge of its properties increased.

The difficulty of obtaining uniform texture in castings (on which its strength so much depends), the effect of improper treatment of iron in casting, such as removing it red-hot from the moulds, and the impossibility of judging from external appearance alone, make it imperatively necessary that every cast-iron beam should be subjected to some efficient proof, before it is employed in buildings. To obtain the best *forms* for beams, we need scarcely say, is of the utmost importance, and these are as yet far from determined on.

On a previous occasion we urged the desirability of substituting *wrought* iron for cast, in building, wherever it is possible; as much greater reliance may be placed on the former than on the latter. Exactly two years ago, we reviewed at some length an able report by Sir Henry de la Beche and Mr. Thomas Cubitt, on the fall of the cotton mill at Oldham, wherein the importance of this substitution was forcibly expressed.*

It cannot be other than useful, at this moment, to quote the following passage in that report:—

"While on the subject of cast-iron for beams, we would state our strong conviction, founded on a general view of the subject, of the importance of substituting wrought-iron for cast-iron whenever it can be accomplished, and we anticipate that wrought-iron will be rolled into a sufficient size for all the uses to which large cast-iron beams are now applied, judging from the present size of rolled pieces of iron. When this shall have been accomplished, a great advance will have been made in the use of iron, seeing that beams, or other large pieces of that metal, may, with confidence, be relied upon. We consider that when wrought-iron can be thus rolled and employed, its use will become most extensive, and that the consumption of iron for building purposes would be greatly increased, to the benefit of an important branch of our national industry.

Seeing the increased and increasing employment of cast-iron in buildings in various parts of the country; considering that there is frequent neglect of the form and strength of the cast-iron beams and columns so employed, placing many lives in peril, a neglect not unfrequently arising from an absence of sufficient information on the subject; and regarding extensive knowledge on this head as not only of great importance to your Majesty's corps of Royal Engineers, but also as more likely to be advanced by rendering available the knowledge possessed by that able corps, than by applying to any other body of men in your Majesty's service, we would recommend that, at such times as may be deemed proper, experiments respecting the best and strongest forms of cast and wrought-iron beams and columns should be conducted by officers of the Royal Engineers, at your Majesty's arsenal at Woolwich, or elsewhere, as may be considered expedient, under the control of the Master-General and Board of Ordnance.

We would venture to anticipate that such experiments, so conducted, would be of great public importance, not only by testing the value of those hitherto made, but also by leading to highly beneficial and practical results, the more beneficial in proportion as a knowledge of them could be disseminated by publications of a moderate price, thus spreading the needful information so as to aid those requiring it, and check those who may wilfully neglect, or not be sufficiently thoughtful of the risk of human life."

The hinderance in the way of obtaining wrought-iron beams of sufficient size, is the expense of the works necessary for their production. The demand at this moment is not sufficient to induce individuals to risk the large capital that would be required for such an undertaking; and unless the government lend their aid, it may be a long time before any thing is done in this behalf.

* See Vol. III., p. 277 and p. 289.

Mr. Cubitt, in a postscript to the report alluded to, dwelt on this at some length, and was quoted by us at the time. He suggested for the consideration of government, the expediency of devoting 1,000*l.* or 1,500*l.* to this purpose, and proposed that premiums should be offered for the best and strongest rolled iron beams, calculated for the use of floors, to sustain a load not under twenty-five tons, with bearings not less than 24 feet apart. We would strongly urge this very important subject on the attention of men in power. We are far from desiring to be alarmists, but we only express what we have often felt (long before the fall of this bridge on the Chester Railway), when we say, that there are many structures wherein the cast-iron employed is the germ of a disaster, and that the stability of such during even several years is no assurance against the occurrence of an accident, instantaneous and terrible.

ROYAL INSTITUTE OF ARCHITECTS.

On Monday evening last, at an ordinary meeting of the Institute, Mr. Charles Fowler, V. P., in the chair, Mr. Clayton forwarded drawings of the remains of the round church in Ludlow Castle, and various other presents were announced. The Dean of Hereford, in presenting a copy of Mr. Phillips' appeal in favour of the restoration of Hereford Cathedral, made some observations on the works, and on the growing desire felt by the laity, as well as the clergy, to see our fine old churches restored. The Foreign Secretary presented a copy of a work by the Chev. Canina, on the structures of a part of Italy, from the Dowager Queen of Sardinia; and from Canina himself, a copy of his work on Rome, in the Christian times. M. Cæsar Daly forwarded a number of parts of the *Revue Generale de l'Architecture;* and Mr. Allason, his work on the Antiquities of Pola, Stanhope's Travels, and a paper from the *Quarterly*, establishing Mr. Allason's claim to the discovery of the *entasis* in Greek columns.

Mr. Brown exhibited a very curious marble panel found in Pompeii, which was beautifully sculptured on both sides. Some persons had thought that such decorative panels were hung up between columns, during the festivals of Bacchus, but Mr. Brown considered it had been used to fill a window opening; and that it had turned on a pivot, top and bottom. The heads carved upon it shewed very high art.

A cast of a bust in zinc, by a process recently discovered in Paris, was exhibited. The appearance of bronze was given to it, and it was stated to be very cheap.

Mr. J. G. Crace then read an account of the Palaces of Blois and Chambord, which will be found at length in our present number, and exhibited a variety of interesting illustrations of the Renaissance style of art from those buildings.

In the course of a long discussion which ensued at the close of the paper, Professor Donaldson observed that we had few works of the Renaissance in England to compare with those in France. There were two or three at Cambridge, of which the details were very good. At Blois, while the details were classic, the pervading sentiment was Gothic. To study works of this character, wherein there was much fancy and imagination, architects must go to France. The severe style of art was losing ground in England, and he thought it very probable that that of the Renaissance would be more practised here than it had been. He could not conclude without remarking how ably Mr. Crace, to whom they owed the paper of the evening, had carried out the views of Mr. Barry at the House of Lords.

Mr. l'Anson agreed in the opinion that we had no specimens of the Renaissance comparable with those of France. The screen in King's College Chapel, Cambridge, occurred to him as one of the few good examples. If we recalled the history of the countries, the reason of the difference was obvious. France, always fond of war, invaded Italy, and Francis I. brought thence Italian artists and a love of art. The Gothic of France of the period preceding the Renaissance, and practised contemporaneously with the style of the latter, was better than ours of the same period. For the great beauty of the ornaments and details in works of the Renaissance, France was indebted to the *cinque-centists* of Italy. The Renaissance was now and had been for some time the prevailing taste of Paris.

The Dean of Westminster remarked that there were some good decorations at Thornbury, which might stand fairly by the side of those at Blois. The desolation of Chambord had been mentioned: it was worth stating that one fragment of art there had been preserved. This was, the side-board of the founder. The last use made of it was for the embalming the body of Marshal Saxe! It was of stone, and had escaped destruction through its worthlessness. The Dean then made some observations, incidentally, on the use of the lias stone: several old towers near Bristol were constructed of it, and had lasted well. He thought it desirable the quarries should be again looked to. There were other stones, too, which might be made available, being more durable than the Bath oolite. Several of the Bath stone bridges on the Great Western Railway were already scaling and splitting.

The Chairman thought it most desirable that new materials, opened to us by the gigantic works of railroad companies, should be tested and made available.

AN ACCOUNT OF THE PALACE OF BLOIS AND PALACE OF CHAMBORD, FRANCE.

ESPECIALLY OF THE DECORATIONS.

Having been much interested during an excursion made to Touraine, in the autumn of last year, by visits to Blois, Chambord, Chenouceaux, Amboise, and other monuments of the Renaissance style of architecture, which abound in that district of France, I am induced to lay before you a description of what I saw at the two former of those places, Blois and Chambord.

The town of Blois, on the river Loire, is of very considerable antiquity, and contains many objects highly interesting to the lover of mediæval art. It lies between two hills, on one of which is the cathedral, on the other the palace or castle.

The Castle of Blois is supposed to stand on the site of a Roman camp. Mention is made of it in history about the ninth century. I do not attempt to detail to you its various possessors, but merely observe, that in the year 1292 it first came to the De Chatillons, who are supposed to have built parts of the castle. Froissart, who was chaplain to Guy de Chatillon, Count de Blois, says, that it was "grand and strong, and one of the handsomest in France." By this Count Guy it was sold, as indignantly mentioned by Froissart, to Louis d'Orleans, brother to King Charles VI., who took possession in 1397. The Orleans retained the property till their descendant became King of France under the title of Louis XII.; it then remained crown property till Louis XIII. bestowed it on his brother, Gaston d'Orleans, at whose death it seems to have reverted to the crown, and at the Revolution to have become public property. Viewed as you ascend from the town, the castle appears rising from a mass of rock, on which is an imposing base of solid masonry, giving the idea of a fortress of considerable strength. Passing the west front of the building, you arrive at the Place des Jesuites, when the eye is struck with the magnificent north front of the quarter erected by Francis I. This front is entirely of stone; partly in two and partly in three stories. The windows are in arched recesses, relieved with deep colouring, producing a rich and powerful effect; between the windows are pilasters, and where these are double they are separated by niches and deep recesses. Picturesque bays also project in various parts of this façade. A large circular tower marks the old *tour des oubliettes*, or the *donjon*, considered one of the oldest parts of the building. The roof is separated from the entablature by a series of columns, thus forming an open gallery, and from the pedestals of these columns project tremendous gargels. To my mind the effect of this front is truly beautiful, and a successful example of the introduction of colour to architectural exterior. Part of the building was erected by the architect Mansard, by direction of Gaston d'Orleans, in the reign of Louis XIII., in a style of art seen to great disadvantage beside the beautiful front I have attempted to describe.

Leaving the *Place*, we approach the east front of the exterior, constructed by Louis XII. It is of brick, with ornamental stone dressings. I regret not being able to shew a view of this front, which is very picturesque, I sketched one window, and also—what is the principal object—the canopied recess that formerly contained the equestrian statue of King Louis XII. This recess, surmounted by its canopy, is of stone beautifully wrought. I have ventured to restore, in the drawing, the colouring to the back-ground, powdered with gold *fleurs-de-lis*, and to replace the statue as it existed previous to the Revolution, from a drawing in a manuscript by Felibien. On the fascia under the statue was formerly placed an inscription, in Latin, which may be thus translated:—

> "Where by the grace of God Louis was born,
> Here also, with a noble hand, he assumed the royal sceptre.
> Happy the day which announced the coming of so great a monarch.
> France could not have found a king more worthy of her."

That statue and the inscription are alike removed, and on the same fascia is now written "Caserne d'Infanterie." The palace of Louis XII. "the father of his people," is now a barrack.

Under this canopy is an archway, forming the principal entrance to the interior court of the palace. This court consists of an irregular square, the four sides of which are in as many styles of architecture. On the south, the Gothic of the fifteenth century; on the east, the elaborately ornamented Gothic of Louis XII.; on the north, the elegant *renaissance* of Francis I.; and on the west, the Franco-Italian style of Mansard: all these, full of irregularities, produce an *ensemble* picturesque and charming to the eyes of all, and most interesting to the lover of art.

The south side of the building, looking towards the interior court, was altered and partly rebuilt by the old Dukes of Orleans. It is of an unpretending style of domestic Gothic, the outer walls being of brick, the windows and dressings of stone. In this quarter, in addition to various apartments, is the old chapel of St. Calais, which dates from a much earlier period; a view of it can be seen in Androuet Ducerceau.

The east side of the court is the building erected by Louis XII.; it is of red brick, with window dressings, string courses, and enrichments of stone richly carved; above, rises a high roof formerly crested with gilt metalwork, from which project dormers in stone of beautiful tracery, the whole resting in front on a colonnade, forming a sort of cloister; the stone pillars being diapered with trellis work, in which were formerly *fleurs-de-lis* and ermines. This quarter contains the apartments occupied by King Louis XII., which, though now under one universal coat of whitewash and all in the occupation of soldiers, were formerly fitted up with regal splendour.

Here, in the year 1501, King Louis XII. received in this building the Archduke Phillip of Austria, and a chronicler of the period gives a most complete and interesting description of the palace as it then appeared. The east front was then just finished, its network of stone shewn in all its brilliant freshness on its bright brick ground; the carvings were seen in all their perfection; a profusion of *fleurs-de-lis* and ermines, sculptured or painted, were spread over the building; gold, purple, and azure dazzled the eye in every direction, even up to the roof, whose crestings and enrichments were also gilt; over every door was seen the royal badge of the porcupine spreading out its quills, and over the entrance archway was the splendid statute of the king himself, young and handsome, noble and full of grace, as he then was.

Nor was the interior less magnificently decorated: rich tapestries, wrought in figures or flowers, or ornaments, furnished the walls; over the floors were spread thick carpets. The chimney-pieces were blazoned with heraldic shields, paintings, and devices; the joists of the ceilings (for they were unplastered then) glittered with gilding and elegant decoration; furniture, carved with the utmost delicacy of finish; beds, covered in the richest stuffs, embroidered in gold and in silks of all colours

—these ornamented the apartments. And as if to recall the salutary thought of death, in the midst of all that was gay and joyful there was painted, as was usual then, the celebrated dance, *Macabre*, on the walls under the piazza or colonnade.

The king was proud of his palace, and right royally did he receive his visitors. Our chronicler, after describing with much interesing detail the procession by torchlight, the reception of the archduke and duchess, and the ceremonies of introduction to the king and queen, continues his description of the apartments of the palace.

"The Grand Hall, by which the archduke and duchess entered, was of great size, and hung with a tapestry of the Destruction of Troy; and in the like manner also a chapel at the end of the hall. The room where the king dined, and where the archduchess was, was hung with a tapestry of a battle. Over the chimney was a grand mantle of cloth of gold, craped very rich. The chamber of young Madame Claude was next to the king's, and was hung with a tapestry of pastorals, all small, with inscriptions, which was very fine. Afterwards came the chamber of the queen, hung with a tapestry of strange beasts and birds, with figures from foreign countries; and in said room was a bed, all dressed out with cloth of gold, craped very rich; and above the bed a canopy of crimson damask. In the lodgings of the archduke there was a gallery, hung with tapestry of the deeds of the Trojans; after that a grand chamber, hung with tapestry of the actions of Alexander the Great, and a mantle over the chimney, of cloth of gold, craped. From the ceiling of this room hung two chandeliers, marvellously large, of silver, made crossways, for placing on each four flambeaux, which chandeliers hung by great chains of silver. At the end of this room was the chamber of the archduchess, where the said lady and gentleman slept, which was hung with cloth of gold, wove with black and red. Here were two beds, of which the one in which they slept was of stuff embroidered in gold, and curtains of the same, lined with white damask: and above this bed was a canopy, the top of cloth of gold, the curtains of taffetty, yellow and red.

The other bed was furnished in the same manner, and on each were coverlets of cloth of gold, and inside them sheets of linen from Holland. All around the beds, and on the buffet were carpets of cloth of gold. In the corner by the bed was a gilt chair, admirably wrought by Italians, of which the seat, &c. was covered with cloth of gold, fringed all round with fringes of gold and silver. Before the chimney was another chair, also covered with cloth of gold, and there was carpet of the same stuff under it; also, there were many rich cushions in the room to sit upon."

And thus goes on our chronicler, describing every room: one hung with crimson velvet embroidered with K's and A's, crowned; another with crimson embroidered with cords and the arms of Burgundy; another with brocade, yellow and grey, powdered with S's in black velvet; another with crimson satin embroidered in flames of fire, and at the angles and in the centre were lions in wreaths, entirely covered in pearls, and which were mighty rich to see, and cost 40 to 50,000 ducats. And the chronicler further takes care to remark, that all the said stuffs and tapestries were as fresh and good as new, and that the floors of all the rooms were covered with carpets of velvet, so that nothing of the floors was seen.

Thus was furnished this palace of a king of France at a time contemporary with the reign of our Henry VII.

At each extremity of the front of Louis XII., and forming part of the work erected by him, is a square tower of picturesque appearance. It contains a staircase of considerable elegance. The stairs radiate round a centre shaft, which is formed of clustering columns terminating in a crown at top, from which rises a vaulted ceiling. Though the construction and many of the details are Gothic, yet some of the ornaments partake of an Italian character.

From this staircase we pass to the part of the palace the most historically famous, the ancient *Salle des Etats*, a large building, of somewhat plain appearance, dating about the thirteenth century, although several alterations of a later period have been made to its windows, &c. In this spacious hall the three estates of the kingdom used formerly to assemble. It has a rude and bare appearance; down the centre range a series of pointed arches, resting on columns supporting the roof, and dividing the ceiling into two parts, which are arched, and simply covered with flat boards. In the reign of Henry III. the states were summoned to meet here; and it was during their assembly that the powerful Duc de Guise was murdered in one of the apartments of the palace. The hall was then richly ornamented; the walls were hung with splendid tapestry, worked in figures, relieved with gold; the columns covered with purple velvet, powdered with gold *fleurs-de-lis;* and the ceiling was also covered with tapestry. A platform was raised nearly in the centre, behind one of the arches, on which was placed the throne of the king, all being covered with purple velvet, powdered with gold *fleurs-de-lis*, and on this, and on the steps to it, were seats for the blood royal; behind stood the archers of the guard; in front, and on either side, were the three estates, and in galleries at the end were seats for ladies;—the common people were also allowed to enter within certain barriers. The king descended from his apartments into the hall by wooden stairs at the end, but which stairs are now removed.

Adjoining the ancient *Salle des Etats*, and forming the northern side of the quadrangle, is that quarter of the palace erected by Francis I. This front, by the elegance of its proportions, the beauty of its details, and the grandeur of its effect, is by far the most imposing feature in the whole building, and a most tasteful specimen of the Renaissance style of architecture. The exterior front, towards the *Place des Jesuites*, I have already described; this, towards the interior court, is altogether different: here we have more elaborate decoration and greater delicacy of finish. It is entirely of stone, and composed of two principal floors, decorated by pilasters and panellings; round the windows are interlaced enrichments, and the reveals are panelled, and were, I suspect, formerly relieved with colour. Above is an entablature of considerable richness and beautiful effect. Its modillions project to some extent, and above them is a kind of machicolation, containing shell enrichments in its recesses; over this rises an ornamental balustrade, formed of the letters F and C, for the initials of Francis I. and Claude of France. From the roof project dormer windows of graceful outline; and even the chimney-shafts are enriched, and by no means unworthy of remark. The roof itself was formerly crested with an ornament composed of *fleurs-de-lis*, gilded. Below was formerly a colonnade supporting a gallery, as given by Ducerceau, which, although now removed, is about to be restored. But the principal object in this front, and which gives a charm to the whole, is the grand open staircase, situate about the centre of the façade, and projecting in front of it. This has lately been restored, and now shines forth in the full beauty of all its delicate and tasteful workmanship. The balustrades are formed of open carvings of foliage and the crawling salamander. Niches of most elaborate detail and elegant arabesques adorn the shafts of the pilasters; twining foliage is sculptured round the mouldings of the window openings;—in every part does ornament seem to clothe this magnificent work of art like the delicate foliage and clinging tendrils of the ivy clustering round a tree, yet nowhere does it superabound or appear misplaced.

The interior of this staircase is also ornamented with carved niches and enrichments; mounting its steps, we enter the suite of apartments on the first floor, being those formerly occupied by Queen Catherine de Medici. The first is called the *Salle des Gardes*, or guard chamber, a room of considerable size. The chimney-piece of stone, though massive in construction, is to be noticed for the elegance and richness of its ornaments; the stair door-frame is decorated, and has over it the salamander in flames, the badge of Francis I. The ceiling here, as in most of the rooms in this building, is formed of beams, which are, in fact, the floor-joists of the room above; the effect of these, when painted, is by no means unpleasing. I made a sketch of the decorations lately executed on this ceiling, in which the initials, arms, and badges are mingled, with forcible contrasts of colour; whether the precise pattern is a restoration or not, I had no means of discovering; but there are many old examples of this mode of ornamenting the ceilings still remaining at Chenouceaux, Fontainbleau, and other places; and in Venice, almost all the older palaces have the ceilings decorated in this way, with arabesques and inlaid ornaments of great variety and beauty. The walls of this chamber are now bare, so they are all, in fact; nothing now remains of the splendour that dazzled the eyes, or the works of art that delighted the mind, during the time of Francis I. We pass through a multitude of rooms, but all are desolate alike—each has suffered the distressing calamity of whitewash—not a vestige of furniture, not a hanging remains. The chimney-pieces alone attest the magnificence and beauty with which the remainder must have been ornamented. I anticipated the pleasure of sketching these, which possess a rich fund of *renaissance* art, but a custodian abruptly prohibited my making further drawings; and I was thus prevented taking many details in the interior that might have proved interesting. The state-rooms seem to have been situated on this court-side of the building; and on the other, looking towards the *Place des Jesuites*, were the large bed-room and private apartments of the queen; amongst others, her cabinet. In this the walls are covered by carved panelling, the details of which are executed with much spirit and taste.

Again mounting the open staircase, we reach the floor above, the disposition of the rooms on which is exactly similar to the one we have left. These were the apartments occupied by King Henry III. You enter first the *Salle des Gardes*, which served also as a council chamber; from hence you pass into the king's bed-room, a very spacious apartment looking towards the *Place des Jesuites*. Here occurred the tragedy of the murder of the celebrated Duc de Guise.

The cabinet of the king is next this chamber; it is a small room, which still retains some traces of decorations. On the ceiling are to be distinguished slight remains of colouring, and arabesque ornament in fresco may still be seen on the linings of the window recess. On the left of the bed-chamber you enter a sort of passage which leads to the old Tour des Oubliettes or Donjon, of which so many horrors are retailed; at present nothing but bare walls of considerable thickness are to be seen.

Above this second floor are a range of rooms in the roof, but these contain no ornamental or interesting feature of any kind except that a most extensive view of the adjoining country is to be obtained from the open gallery outside them.

Of the west front I have little to say; it is that erected by Gaston d'Orleans, in the time of Louis XIII. As a structure away from these middle age remains, it would probably be admired, but here it is thoroughly out of place. It stands on the site of a part of the ancient château erected by the old Dukes of Orleans.

Before leaving the Château de Blois, I must not omit to call attention to an old tower, used subsequently as an observatory and astrological study by Catherine de Medici.*

JOHN GREGORY CRACE.

THE BRITTON TESTIMONIAL.—One of a series of dinners, to which we have before referred, arranged by those gentlemen who are interesting themselves most in the testimonial to our excellent old friend, Mr. Britton, was given at Long's Hotel, on Wednesday evening last. Mr. Britton was there, and Mr. William Took, Mr. Gould, Mr. Thomas Cubitt, Mr. Herbert, Mr. Lewis Pocock, Mr. Grissell, Mr. Gibbons, and Mr. William Jerdan. Mr. Peter Cunningham and Mr. Godwin were the hosts. Mr. Britton read a pleasant sketch of the progress of what has become the "Britton Club;" and "Literature," "Art," the "Constructive Sciences," and "Friendship," were duly honoured and responded to. Her Majesty the Queen has forwarded a subscription of ten guineas to the fund, and Lord Lansdowne, the Dean of Westminster, Sir Edward Bulwer Lytton, Mr. Crofton Croker, the Rev. Thomas Dale, Sir Thomas Phillips, Sir Thomas Dean, &c., have added their names to the list of subscribers.

* The account of Chambord next week

ART-UNION OF LONDON.

The council being deputed to select a work of art for a 150*l.* prizeholder, have purchased Mr. L. Haghe's fine work at the New Water Colour Gallery, "Meeting-room of the Brewer's Corporation at Antwerp," which, strange to say, had remained until this time without a purchaser. They have also selected one of the best of Mr. Hurlstone's works, from the Society of British Artists.

A beautiful plate, by Bacon, after Wehnert, "The prisoner of Gisors," has been bought by the council. A print of this, in addition to the illustrated "Allegro" and "Penseroso," will be presented to each subscriber of the current year. Mr. Herbert, R.A., and Mr. David Roberts, R.A., have added their names to the list of artists by whom these illustrations will be executed.*

THE STATUE STILL UPON THE ARCH.

The further removal, last week, of the scaffolding by the side of the arch at Hyde Park Corner, alarmed many of our readers out of their propriety, and produced us a crop of violent letters on the subject. Our former correspondent, "An Inhabitant of May-fair," expresses the feelings of horror with which, on returning to town after a visit to the country, he saw the statue still in its place, and the means of removal taken away. He continues, "I must confess, however, notwithstanding these feelings, mixed with anger, at the breach of faith on the part of Government, in not having removed the statue, that a degree of satisfaction came over me, when I saw this most absurd conjunction thus fully exposed; I felt what a length of wordy warfare would have been spared, had the "whole hog," as it is now, been shewn at first. But, Sir, despite of this, despite of the declared, decided opinions of the Royal Academy, of the Institute of Architects, of very many others of the highest knowledge of art, and of the Government itself—in the face of all these, is this obstinate committee, now actually taking away more of the means for the removal of the statue, seeming determined, *nolens volens*, that this defacement of the metropolis shall continue, in open derision of all public taste, and in insolent defiance of public opinion."

In the House of Commons, on Monday, Mr. C. Berkeley, who was to have asked a question relative to the Wellington statue, stated that he had received a communication from the noble lord the Chief Commissioner of Woods and Forests, requesting him to postpone doing so. Would the noble lord be able to answer the question on Friday or Monday next? Lord J. Russell replied, that the hon. gentleman would be aware that the committee for erecting the statue had declared, that the effect could not be seen till the scaffolding was removed. The scaffolding having now been removed to the extent they wished, he would be ready to answer the hon. gentleman's question on Friday or Monday next.

All London has already answered the question pretty conclusively; and, for our own part, we thought that the Government had done so too.

FOREIGN ARCHITECTURAL AND COLLATERAL INTELLIGENCE.

Francesco Inghirami—the noted Italian antiquary, lately dead—was born at Volterra in 1772, and passed his first years of maturity in the military service of the order of Malta. Returned to his native place, it was the quarries of alabaster of that city, and the works made thereof, which first attracted his notice. They occupy nearly 300 persons, and the columns, capitals, vases, &c. made there, are conveyed over the whole of Europe. It is in eight different places that the hills above Volterra are opened for this purpose, which whitens the houses, as those of Lüttich are blackened by other sorts of industry. Having been thus directed towards art, Inghirami made a complete course of drawing at the Academy of Florence, and subsequently became a constant companion of Philip Hackert, and thus improved much in landscape and other painting. His acquaintance with Lanzi turned him towards antiquity; and, on his return to Volterra, he became librarian and director of the Etruscan Museum. About this time (1810) he published his remarks on Micali's splendid work, "L'Italia avanti il dominio dei Romani." This induced him to devote his whole time to the study of Etruscan antiquities, to which his transfer to Florence was very favourable. For, combining all his purposes in one establishment, he employed about forty draughtsmen, engravers, &c., in the old abbey of Fiesole (a work of Brunelleschi), under the name of Poligrafia Fiesolana. Here he brought out: "Monumenti. Etruschi o di Etrusco nome," 10 vols. 4to., 1820—1826. Then "The Galleria Homerica," 3 vols. 8vo., 1831—1835, at which Tischbein, and subsequently Schorn, co-operated. An entirely new vein of antiquarian knowledge was developed in Inghirami's "Etrusco Museo Chiusino," 2 vols. 4to., 1833, which represented and described a very rich collection of the ruins of this place, distant from the general road of antiquarian research. Another work of original stamp was his "Pitture di vasi fittili," 4 vols., 1835—1837, in which he intended to give a complete selection of all vase pictures interesting for the history of art or civilization, or ancient mythology. His works on the antiquities of his native town and Tuscany are many—as *Sulle ricerche di Vetulonia*, his description of Fiesole and its Badia, of the Palazzo Pitti, &c. The only fruit, however, of an activity of sixty years' duration, says Mr. Polidori, was *poverty*.—[*Archivo storico Italiano.*]

The Paving of the Champs Elisées and of the Avennes des Invalides.—The great *avenue* of the Champs Elisées is to be provided with a substantial, uniform macadamising instead of the present pavement, which is to be transected by bitumen foot-paths for the easier crossing of promenaders. There are also behind the Hotel des Invalides several large avennes planted with trees, such as A. de Vilars, Saxe, &c., which are to be included in this plan. All these well-aired places will increase in importance and value by the present amelioration.

The Eglise of St. Denis—will receive an additional ornament in two niches, which formed part of the front of the old church near the Caserne des Célestines, now demolishing. They contain the statues of Charles V. and Queen Jeanne de Bourbon, and have been presented by the municipality of Paris to the Minister of Public works.

Covered Street Arcades at Paris.—A huge company, with a capital of fifty millions of francs, has just been formed, for constructing a series of *passages couverts* from the Boulevard St. Denis to the Place du Châtelet. The company to be called *C. des Galeries du Commerce.*

New Houses of Parliament at Berlin.—As the procedures of this body turn out satisfactorily both to themselves and Government, plans for the erection of a permanent locale have been of late canvassed. The meeting of the representatives of a nation within the precincts of a royal residence might have done very well in the middle ages, but is quite incongruous now—even considering the mere rooms required for the diverse committees, the spaces for the library, and the piling and classifying of documents and records. As Berlin has (*under* Schinkel) grown up rather in a classic style of architecture, the same was, at first, thought of for the projected new houses. But the saying of Goethe, that "columns and windows will never agree," seems to be thrown in the scale—and thus it may be, that the new Houses on the banks of the Thames may serve as a model for the Imperial Parliament of Prussia.

Art-Union of Bonn.—Since the great Dusseldorf Gallery had been *abducted* to Munich, the Nether-rhine was deficient in any larger collection of pictures. Still a great many art-works had remained behind from the time of the art-friendly electors, as well as the mediæval art-bloom of Cologne and Westphalia. On this account a society has been formed at Bonn to start an exhibition. The committee have invited many art-friends with the best success, where a number of paintings, most interesting for the history of art—even some Italian and Spanish works—have been found. Thus a room of armoury, also one for engravings, and another for modern paintings, will be arranged; for which latter object the Dusseldorf Steam Navigation Company have granted an exemption from freight. The exhibition will take place in the progressing building of the *Hospital.*

Artesian Wells at Venice.—As the first well of the kind bored on Campo St. Paolo has yielded satisfactory results, another has been made, of late, on the same locality. At a depth of 60 metres, strata of grit were attained, which being perforated, yielded an abundant stream of water. The column rises eight feet above ground, and yields every minute 160 litres of water. It created a thorough astonishment with the assembled multitude, that the stream of water, being brought in contact with a flame, burnt in a most vivid manner, which is produced by the carburetted hydrogen gas it contains. This gas, which is often a concomitant of artesian springs, has been used for ages past as a means of lighting coal-mines in China, where it astonished some of the French missionaries, even before the introduction of gas-lighting in Europe. It is, however, an important question, whether such hydrogenized water as that of Venice will turn out potable.

Grand Viaduct over the Garonne, at Bordeaux.—This extensive plan had occupied, for some time, the study of a *commission nautique*, instituted by order of the secretary of public works. The commission have decided on the execution of this great structure, by the means of which the Paris Railway will pass the Garonne, near Paludate, where a great terminus is to be erected for the combined three lines of Paris, Bordeaux, and Cette. The commission have formed a plan, which will neither influence the *regime* of the stream, nor encroach on the interests of navigation. The viaduct will be at a distance of 1,000 metres from the bridge of Bordeaux. The length of the span for crossing the main of the river to be 600 metres; but this length will have to be much extended on both sides, where the floodings of the stream take place, and would interrupt the communication with the lines. This work will be one of great difficulties, on account of the driving of the piles, as there is no solid ground but at the depth of 17 metres under the middle height of the river. The expense is estimated at ten millions of francs. [The French press begin already to *grumble* at the injudicious planning of so many *costly* works, surpassing the financial capabilities of the land.]

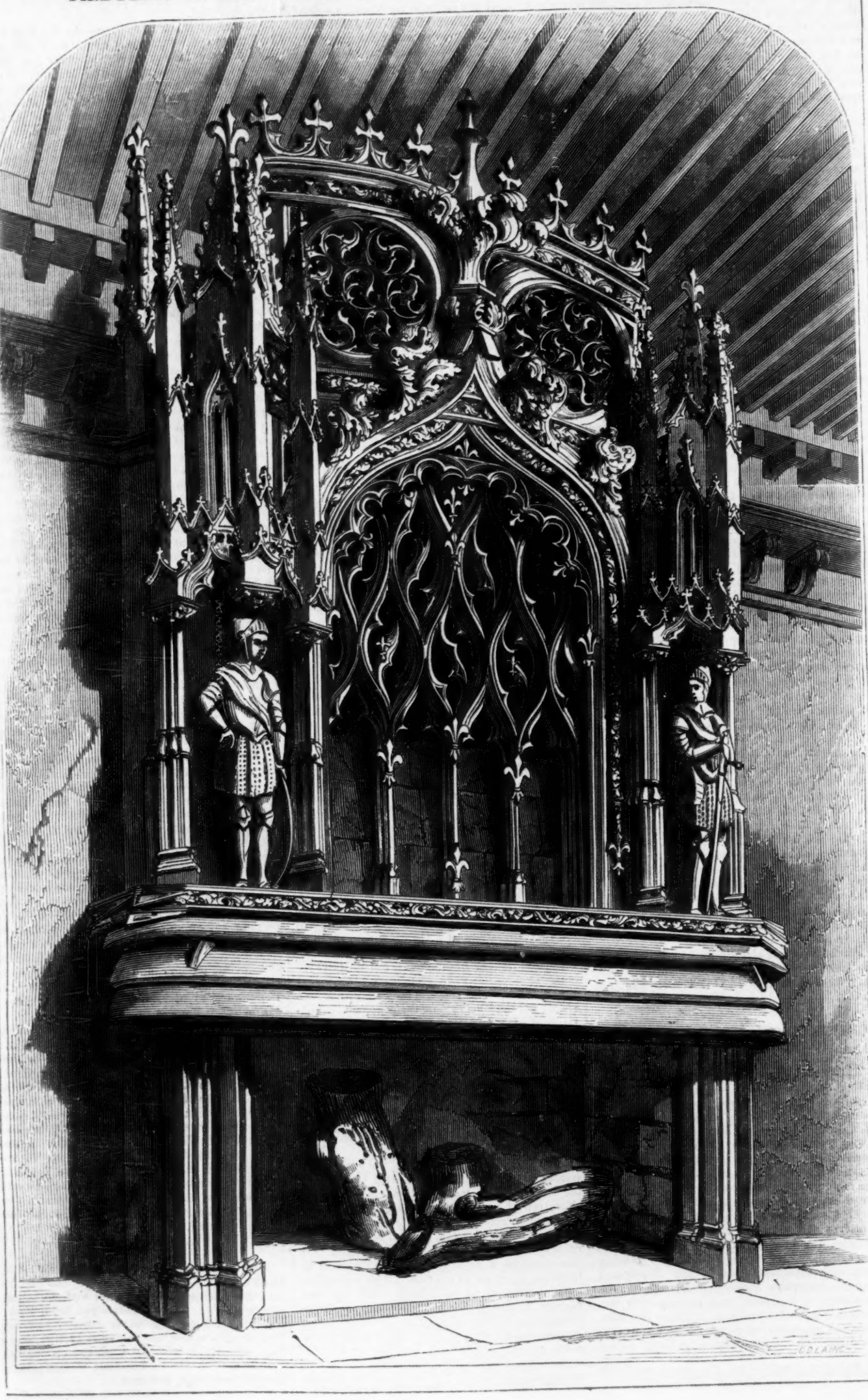
The great European Railway Festival.—A German journal proposes the celebration of a festival of a novel character. It is to be celebrated on the completion of "*the great European lines*," as that from Berlin to St. Petersburg; St. Petersburg to Moskow and Odessa; Berlin to Vienna; Vienna to Triest; Paris to Marseilles. Simultaneous trains are thus proposed to start from all the *maritime* termini on the Mediterranean, the Baltic, the Adriatic, and the Black Sea, and to centre in some city to be afterwards agreed upon, where this converging and combination of man's traffic and industry (an emblem of their social and political brotherhood) ought to be solemnised by appropriate popular and state festivals. Our cotemporary thinks, that the distance from St. Petersburg to Marseilles (about 1,200 miles) can be safely done in three days.

Improvements in China.—[From the *Peking Gazette.*]—The paving of this metropolis has been hitherto so bad, that after rain, horses waded up to their hips in mud, even in the principal streets. The means with which this improvement is to be effected are most characteristic, and worthy of notice. China was, at former times, so overburthened with specie, that whole cases of gold and silver ingots were sunk in the canal of Mukden as a reserve for future emergencies. In the present case, the Emperor orders that some capital (lying idle) should be placed on interest, to be employed in the paving of Peking, the improvement of the Imperial Canal, &c.

NEW WORKS IN EGYPT.—Mougel Bey, the chief engineer of the Nile barrage, has 12,000 men day and night driving piles with the steam pile-driving machines recently got from England, and which, with other machinery from France, also in use, are valued at 14,000*l.* sterling. A project has just been set on foot at Alexandria to erect a building, to comprise a theatre, exchange, and cassino.

* Mr. Dominic Colnaghi, of Pall Mall East, has just now published two very good lithographs of the honorary secretaries.

FIRE-PLACE IN THE PALACE OF THE DUKES OF BURGUNDY, AT DIJON.



GEOMETRY OF THE SQUARE.

Fig. 1.

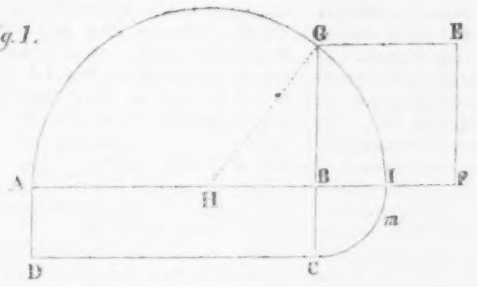


Fig. 2.

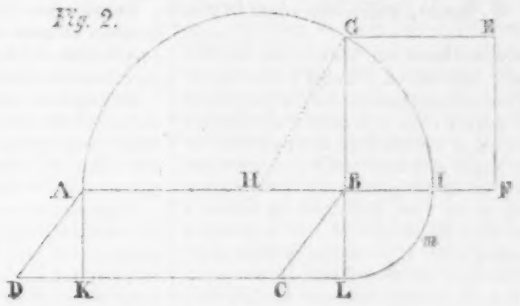


Fig. 3.

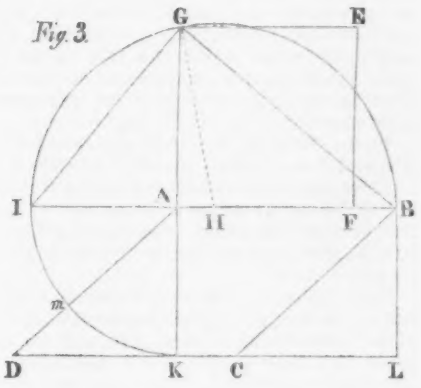


Fig. 4

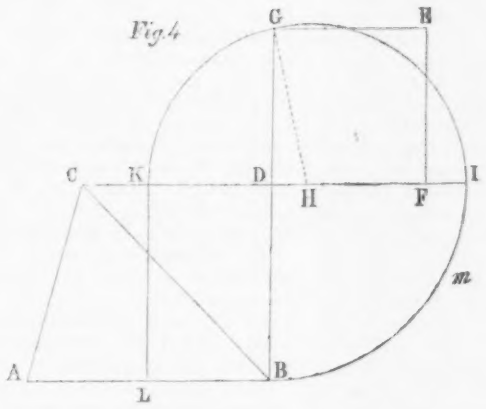
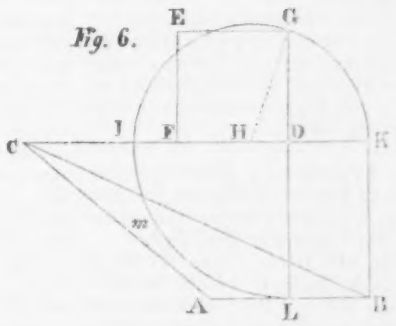


Fig. 6.



GOTHIC STONE CHIMNEY PIECE.

IN THE GUARD CHAMBER OF THE ANCIENT PALACE OF THE DUKES OF BURGUNDY, AT DIJON IN FRANCE.

The palace at Dijon was erected by Philip the Good, at a time when the latest French Gothic, or Flamboyant, was beginning to be debased by an admixture of Italian detail. Mr. Dawson Turner terms the style thus formed, "Burgundian:" it was wholly employed in domestic buildings; "no distinct examples of it can be dated anterior to the reign of Philip the Good, and buildings bearing its characteristics are found in all the states which were under his authority" (Britton). The fire-place illustrated, appears not a very pure specimen of any distinct style; it has an admixture of the earlier French Gothic or Rayonnant. The flat arch, the cavetto of the arch filled with running foliage, and the decorated niches on each side, are of the Flamboyant character. There does not appear to be any Italian detail at all in it. The date is probably the latter end of the 15th century. Fire-places of the Gothic period generally projected considerably into the room, having the upper portion of a pyramidal form to convey the flue into the wall. The decorated stone-work in the French example conceals this contrivance effectually, and it is probably the most elegant specimen remaining. There are several ancient Gothic fire-places with the pyramidal upper part existing, in this country, but they are all undecorated. In France, a small concealed place or chamber was often constructed behind the fire-place. The Duchess De Berry and her attendants were captured in one of these hiding-places, having crowded more into it than the space was intended to hold, and the soldiers having made a large fire in front of them.

The view given is made from materials preserved in the library of the School of Design, Somerset House. C. J. RICHARDSON.

GEOMETRY OF THE SQUARE.

INTRODUCTION.

In our last volume we inserted several papers of a useful nature on the "Conversion of Areas," with the solution of one or two problems allied to the same principle, intended to illustrate its utility in practical constructions. We have since had occasion to refer to these papers in consequence of inquiries from several of our correspondents; we therefore feel inclined to consider the subject somewhat more at large; but in the first place, it is necessary to draw the reader's attention to the following exposition of the motives which have induced us to resume the inquiry.

The object of these papers is to inculcate the universal employment of the scale and compasses in the solution of geometrical and mechanical problems, and thereby to avoid the tedium and prolixity which generally attend the necessary operations when performed by numbers. The great aversion which practical men in general have ever evinced for long and prolix numerical calculations is very well known, and in consequence of this aversion, it frequently happens, that in cases of very great importance, and where the most delicate results would be required for the purpose of ensuring efficiency and safety, no calculation whatever is made, every thing being performed at random, or at best by a rude and imperfect imitation of works already executed, which bear the least resemblance to the cases in hand; and thus it is, that so many failures occur in works, which, to appearance, are perfectly safe; whereas with a little attention to the requisite theoretical maxims, every contingency might be averted and perfect efficiency and safety readily ensured.

But it is not necessary for this purpose, that practical men should be expert calculators, a qualification which, it is to be regretted, but very few of them possess; for by a dextrous use of the scale and compasses, all the necessary operations can be performed with the greatest ease, and to a degree of accuracy more than sufficient for every practical undertaking. Nor is it necessary that the operator should be an expert geometer, for nothing is requisite beyond a knowledge of a few of the very simplest practical problems, which are to be found in every work on common mensuration.

The grand mystery of the subject lies in reducing figures, of whatever form, to one universal standard, thereby rendering the mensuration and comparison of different figures a matter of the greatest ease, and thus avoiding all tedious investigations, and all long and elaborate numerical operations.

By the adoption of this method, the ultimate

process is the same in every case, whatever may be the original form of the figures proposed; for by terminating the process of conversion in a square, the result is always obtained by the simple multiplication of two quantities, or factors, which are equal to one another.

Land-surveyors have long been in the habit of reducing their figures to a triangle; this is, indeed, a very convenient process for the purpose of calculation merely; but it is not at all adapted for a criterion or standard of comparison, because the triangle is a figure of which the magnitude is not easily assignable by the eye, nor does it lead us to that principle by which a given figure may be increased and decreased in any proposed ratio at pleasure, or even multiplied and divided geometrically, in the same manner, and with greater ease and facility than the same processes can be performed by numbers themselves.

The process of conversion, which these papers are intended to illustrate, is not limited in its application; it extends to all plane figures whatever, and in some instances even to the surfaces of solids, such as the cylinder, the sphere, the cone, the conic frustum, and to almost all the solids of revolution, as well as to those contained under regular plane boundaries. It is likewise applicable to the demonstration of a numerous class of geometrical propositions, thereby constituting a very delightful exercise.

Could practical men be therefore induced to direct their attention to the subject, it would be found materially to their advantage, not only as regards the solution of problems which offer themselves in the course of their operations, but also as a means of rendering them familiar with the chief propositions of elementary geometry, without being subjected to the tedious and irksome drudgery of tracing the demonstrations after the strict logical method in which they are usually given. It is true that the demonstrations given in this way are merely tentative, or at the most mechanical, but they are not the less convincing by being derived from measurement; and the ease with which they are obtained by the principles of conversion is a very high recommendation as regards its practical utility.

PROBLEM.—*To construct a square that shall be equal in area to a given rectangular parallelogram; that is, to convert a given rectangular parallelogram into a square of equal area.*

Example. Let ABCD (fig. 1) be the given rectangular parallelogram, of which the containing sides are AB and BC; it is required to convert the rectangular parallelogram ABCD into a square of equal area.

Construction. Produce the side AB directly forward to any convenient length at pleasure, or as far as may be found necessary, and on the point B as a centre, with the side BC as radius, describe the quadrantal arc *l*m*C* meeting AB produced in I, and making BI equal to BC, so that AI is equal to AB and BC taken together, or equal to the sum of the sides of the parallelogram continued out in one straight line.

Bisect the sum of the sides AI in H, and on H as a centre, with HA or HI as radius, describe the semi-circle AGI meeting the production of the side CB in G; then is BC the side of the square sought. Therefore, if upon BG, thus determined, the square BGEF be constructed, it will be equal in area to the rectangular parallelogram ABCD, as required by the problem.

Demonstration. Since the straight line, AI, which is equal to the sum of the sides of the rectangular parallelogram AB and BC, is equally divided in the point H, and unequally in the point B, the rectangle under AB and BI together with the square of BH, is equal to the square of HA or HG, the radius of the semi-circle; but the squares of BH and BG are together equal to the square of HG, because GBH is a right angle; therefore, the squares of BH and BG are together equal to the rectangle under AB and BI, and the square of BH; take away from these equals the square of BH, which is common, and there remains the square of BG, which is equal to the rectangle under AB and BI, or AB and BC, because BI, by construction, is equal to BC; consequently, the square upon BG, that is, the square BGEF, is equal in area to the rectangular parallelogram ABCD. This construction may be otherwise more briefly and elegantly demonstrated, but we prefer the method here employed, as being most in accordance with the plan of our present undertaking.

PROBLEM.—*To construct a square that shall be equal in area to a given rhomboid or oblique parallelogram; that is, to convert a given oblique parallelogram into a square of equal area.*

Example.—Let ABCD (fig. 2) be the given rhomboid or oblique-angled parallelogram, of which the containing sides are AB, BC, CD, and DA; it is required to convert the parallelogram ABCD into a square of equal area.

Construction.—From A and B, the extremities of one of the longer sides, AB, let fall the perpendiculars AK and BL, meeting DC in K, and its extension in L, thereby forming the rectangular parallelogram ABLK, equal to the given rhomboid ABCD. Produce AB directly forward to any indefinite extent, and on B as a centre, with BL as a radius, describe the quadrantal arc L*m*I, meeting AB produced in I, and making BI equal to BL, the side of the derived rectangular parallelogram, so that AI shall be equal to the sum of its containing sides extended in the same straight line.

Bisect AI in H, and on H as a centre, with HA or HI as a radius, describe the semi-circle AGI meeting the side LB produced in G; then is BG the side of the required square. Upon BG, as thus determined, construct the square BGEF, and it will be equal in area to the given rhomboid ABCD.

Demonstration.—Since the rhomboid ABCD and the rectangular parallelogram ABLK are placed upon the same base, AB, and lie between the same parallels, AB and DL, they are equal to one another, the right-angled triangle ADK, which is cut off from the rhomboid by the perpendicular AK, being equal to the triangle BCL, which is applied to it, by CL, the extension of the side DC, and the perpendicular BL meeting that extension. Again, since the straight line AI, which is equal to the sum of the sides AB, BL, of the rectangular parallelogram, ABLK, is divided equally in the point H and unequally in B, the rectangle or product under the two unequal parts AB, BI, together with the square of BH, the part between the points of section, is equal to the square of HI or HG; but the square of HG is equal to the sum of the squares of BH and BG, since HBG is a right-angled triangle, of which HG is the hypothenuse; consequently, the rectangle, or product, under the parts AB and BI, together with the square of BH, is equal to the sum of the squares of BH and and BG; take away the square of BH from these equals, and there remains the rectangle or product, under the parts AB and BI, equal to the square of BG; but BI, by the construction, is equal to BL, the side of the rectangular parallelogram ABLK; therefore, the square of BG, that is, the square BGEF, is equal in area to the rectangle ABLK, and, consequently, to the rhomboid ABCD.

PROBLEM.—*To constitute a square that shall be equal in area to a given rhombus, or an equilateral four-sided figure; that is, to convert a given rhombus or equilateral four-sided figure into a square of equal area.*

Example.—Let ABCD (fig. 3) be the given rhombus or equilateral figure, of which the containing sides are AB, BC, CD, and DA; it is required to convert the rhombus ABCD into a square containing the same or an equal area.

Construction.—From A and B, the extremities of the upper side of the rhombus AB, let fall the perpendiculars AK and BL, meeting the opposite or lower side DC in K, and its extension in L, thereby forming the rectangular parallelogram ABLK, equal in area to the given rhombus ABCD. This is obvious, for parallelograms upon the same base and between the same parallels are equal; but the rectangle ABLK and rhombus ABCD are upon the same base AB, and between the same parallels AB and DL; therefore they are equal.

Upon A as a centre, with AK as a radius, describe the circular quadrant K*m*I, meeting BA produced in I, and making AI equal to AK, the side of the rectangle ABLK, so that BI shall be equal to the sum of its containing sides extended out in the same straight line. Bisect BI in H, and on H as a centre, with HB or HI as a radius, describe the semicircle BGI, meeting KA produced in G; then is AG the side of a square containing an area equal to the rectangle ABLK, and consequently equal to the given rhombus ABCD. On AG describe the square AGEF, and it will be equal to the rectangle ABLK.

For draw GB and GI; then because BGI is an angle in a semi-circle, it is a right angle, and since GA is perpendicular to the diameter IB, the triangles IGA and GBA are similar, and consequently, their corresponding sides are proportional, so that IA is to AG, as AG is to AB; that is, the rectangle under IA and AB is equal to the square of AG; but IA is equal to AK; therefore, the rectangle under AK and AB is equal to the square of AG; hence the square AGEF is equal to the rectangle ABLK, and consequently, equal to the given rhombus ABCD.

PROBLEM.—*To constitute a square that shall be equal in area to a given right lined triangle; that is, to convert a given right-lined triangle into a square of equal area.*

Note.—The solution of this problem branches itself into three cases, for the triangle may be either acute-angled, obtuse-angled, or right-angled; but in all the cases, the principles of solution are the same, excepting only the simplicity of operation.

Example.—Let ABC (fig. 4) be the given right-lined triangle of which the sides are AB, BC, and AC; it is required to convert the triangle ABC into a square of equal area.

Case 1st.—When the triangle is acute-angled.

Construction.—Through C, the vertex of the given triangle ABC, draw the indefinite straight line CI parallel to the base AB, extending it both ways if found necessary so to do, in consequence of the form of the triangle. Bisect the base AB in L, and at the point of bisection L, and also at B, the extremity of the base, erect the perpendiculars LK and BD, meeting the indefinite parallel CI in the points K and D, and constituting thereon the rectangular parallelogram BDKL equal to the given triangle ABC. On the point D as a centre, with DB as a radius, describe the quadrantal arc B*m*I, meeting the straight line CI in the point I, and making DI equal to DB, the side of the equivalent rectangle; then is KI the sum of the two sides KD and DB continued in one straight line. Bisect KI in H, and on H as a centre, with HI or HK as a radius, describe the semicircle KGI intersecting BD, the side of the rectangle produced in G; then is DG the side of a square of equal area with the rectangle BDKL, and also the triangle ABC. Upon DG, as thus determined, construct the square GEFD and the thing required by the problem is accomplished.

Demonstration.—Since the base AB of the triangle ABC is bisected in L, and because the straight lines AB and CD are parallel to one another, the rectangular parallelogram BDKL, which is constituted on half the base BL, is equal to the triangle ABC. Again, since the straight line IK is equally divided in the point H and unequally in D, the rectangle or product under ID and KD, together with the square of DH, is equal to the square of HI or HG; but the square of HG is equal to the sum of the squares of DH and DG, because the angle GDH is a right-angle; consequently, the rectangle or product under ID and KD, together with the square of DH, is equal to the sum of the squares of DH and DG; from these equals take away the square of DH which is common, and there remains the rectangle under ID and KD equal to the square of DG; but DI by construction is equal to DB, the side of the parallelogram; therefore, the square of DG, that is, the square DGEF, is equal to the parallelogram BDKL, and consequently to the triangle ABC.

Case 2nd.—When the triangle is obtuse-angled, as ABC (fig. 6), the sides being AB, AC, and BC, respectively, it is required to convert the triangle ABC into a square of equal area.

Construction.—Through C, the vertex of the triangle, draw the straight line CK parallel to the base of the triangle ABC, extending it as far as necessary to accommodate the construction. Bisect the base AB in L, and through L and B, the middle point and the extremity of the base AB, draw the straight lines LD and BK respectively perpendicular to the base AB, and limited by the parallel line CK passing through C; then is LDKB a rectangular parallelogram equal to the triangle ABC.

On the point D as a centre, with DL as a

radius, describe the circular quadrant LmI meeting the straight line in I, and making DI equal to DL, the side of the rectangle LDKB, so that IK is the sum of the sides DK and DL, extended out in the same straight line. Bisect IK in H, and on H as a centre, with HI or HK as a radius, describe the semicircle KGI, meeting LD produced in G; then is DG the side of a square of equal area with the rectangular parallelogram LDKB, and consequently, equal to the given triangle ABC. Upon DG describe the square DGEF, and the thing required by the problem is done.

Demonstration.—Because the base AB is bisected in L, and the straight lines AB and CK are parallel, the rectangular parallelogram LDKB, which is constituted on half the base, is equal to the triangle ABC; for when a parallelogram and a triangle stand upon the same base and are between the same parallels, the parallelogram is double of the triangle; consequently, when the parallelogram subsists on half the base, it and the triangle are equal. Again, because the straight line IK is equally divided in the point H, and unequally in D, the rectangle or product under ID and KD, together with the square of DH, is equal to the square of HI or HG; but the square of HG is equal to the sum of the squares of DG and DH; therefore, the rectangle under ID and DK, together with the square of DH, is equal to the sum of the squares of DG and DH; from each of these equals take away the square of DH, and there will remain the rectangle under ID and DK, equal to the square of DG; but DI is equal to DL; therefore, the rectangle LDKB is equal to the square DGEF, and, consequentiy, the triangle ABC has been converted into a square of equal area agreeable to the conditions of the problem.

THE VALUATION OF CARPENTERS' AND JOINERS' WORK.

We, long ago, urged the importance of effecting such a change in the mode of measuring and valuing artificers' work, as should lead to a more general adoption of this means of settlement between employers and tradesmen. A work by Mr. Browning, of Stamford, has been recently published, to which, as having this object in view, it seems desirable to direct attention.* We will let the author speak for himself.

"Setting out with the general and acknowledged principle, that, whatever be the variation in the values of work, as depending on changeable and local prices, the average amount of labour and materials in the same examples must in all cases be alike, I concluded that the only permanent and universal guide to correct valuation is a knowledge, by experience or calculation, of the time and materials consumed in each description of work.

With regard to the value of labour only, I found, after having carried my own researches to a considerable extent, that a system, based on the constant quantities of time employed, was long since proposed by Mr. Peter Nicholson, and subsequently extended by writers of more recent date: but whether the other no less important, and certainly more difficult, division of the subject has been similarly treated, I am not aware; and on this ground I venture to offer the following treatise, illustrative, as far as it goes, of the system in question, but capable of extension to numerous examples of ordinary occurrence which hitherto I have had neither time nor opportunity to include."

"In calculating the materials used in the different kinds of joiners' work, I have, as a general rule, reduced the several thicknesses of each description of wood to a standard thickness of 1 inch; the total quantities of which, divided by the contents of the work in superficial feet, give the quanties of inch stuff per foot superficial, whether of fir or oak: these charged at their respective prices, inclusive of the usual allowance for waste and a trifling addition for nails and glue, determine the total value per foot superficial of the materials used. Waste in the length of each piece in cutting off the horns of tenoned joints is calculated in each example.

In order to avoid the great labour attending a separate calculation of each description of framing in its several thicknesses, I determined the surface of stiles and rails, and the surface of panelling to a superficial foot; which, multiplied by their respective thicknesses, gave the quantity of inch stuff per foot superficial in each example. For instance: a door, whose surface is 18 feet sup., with 12·6 feet sup. of stiles and rails, and 9·0 feet sup. of panels, contains ·70 feet sup. of stiles and rails, and ·50 feet sup. of panels per foot superficial: if, then, the example required be 1¼ in. thick, with ¾-in. panels, the quantity of inch stuff per foot superficial is as follows, viz.:—

$$\cdot70 \times 1\tfrac{1}{4} = 1\cdot05$$
$$\cdot50 \times \tfrac{3}{4} = \cdot38$$

1·43 feet super.

And a similar process applied to thicknesses assumed at pleasure, multiplies examples with comparatively little labour."

"When panels of various thicknesses are introduced in the same example, the most correct method of arriving at the quantity of materials, unless by actual measurement of the stuff consumed, is to equalize their thicknesses, and find the quantity of stuff per foot super. by the tables given. Take, for example, a six-panel door, whose two lower panels are 1¼ inches and the four upper panels ¾ in. thick: it is clear the medium thickness is between ¾ in. and 1¼ in., but nearer the former (because the surface of the upper panels exceeds that of the other two)—say 1 inch, which cannot be far wrong: then the quantity of stuff per foot super. is the same as when all the panels are of that thickness."

We take an example of his system from "Framed and ledged doors."

"Doors, 7 feet 3 inches × 3 feet 6 in., with stiles and top rail 5½ inches, and three ledges 9 inches deep.

INCH STUFF PER FOOT SUPERFICIAL.

Thickness of Boarding.	Thickness of Framing.					If Rebated or Matched add—
	In. 2	In. 2¼	In. 2½	In. 2¾	In. 3	
In.	Ft. sup.	Ft. sup.	Ft. sup.	Ft. sup.	Ft. sup.	Ft. sup.
½	1·67	1·84	1·02	2·19	2·37	·06
⅝	1·72	1·89	1·06	2·24	2·41	·07
1	1·76	1·94	2·11	2·28	2·46	·08
1¼	....	2·03	2·20	2·38	2·55	·10

His application of the table is as follows:—

"1. Required the value per foot superficial of materials in 2-inch framed and ledged chaise-house doors, filled in with ¾-inch rebated boarding. Inch stuff (say) 3½d. per foot superficial.

1·67 + ·06 = 1·73 feet super. at 3½d. = 6d. —the value required.

PHOTOG RAPHIC PICTURES.

NEW PROCESS.

At a recent Thursday evening meeting of the Western Literary and Scientific Institution, a lecture on the chemical influences of the solar rays was delivered by Mr. Robert Hunt. The immediate subject of the lecture was the phenomena of "photography" as exhibited in the daguerreotype, and the numerous sensitive processes now employed for obtaining representations of natural objects by means of the camera-obscura; and also by the more simple method of copying by direct radiation. Among the most interesting of the photographic processes described as being the most simple and certain, was the chromatype, discovered by the lecturer. It consists in washing good letter-paper with the following solution:—

Bi-chromate of potash ..... 10 grains,
Sulphate of copper ..... 20 grains,
Distilled water ..... 1 ounce.

Papers prepared with this are of a pale yellow colour; they may be kept for any length of time without injury, and are always ready for use. For copying botanical specimens or engravings nothing can be more beautiful. After the paper has been exposed to the influence of sunshine, with the objects to be copied superposed, it is washed over in the dark with a solution of nitrate of silver of moderate strength. As soon as this is done a very vivid positive picture makes its appearance; and all the fixing these photographic pictures require is, well washing in pure water.

RAILWAY JOTTINGS.

A 'false prophet' of the name of Cort, in a work called 'Railroad Imposition detected,' published only thirteen years since, or in 1834, declared that "long before the Birmingham is ready, such are the improvements now making in canals, that not only may the charge be expected to be many times less than the railway, but the time now lost will be considerably saved; and as a proof of the impotency of the Manchester and Liverpool to compete with water lines, it has not been able to obtain at the end of three years, three months and a half, much above one-sixth of the whole traffic; nor even that, without a total failure as to profit. But granting the Birmingham secured even one-half instead of a sixth, the income estimated at 92,820*l.* would be reduced to 46,410*l.*! The only chance, therefore, for the latter railway in the waggon department, must be confined to goods requiring extraordinary expedition; and these, comparatively, are very few. The Great Western, though probably it may reach as *far* as Bath from Bristol, after having, like a mole, explored its way through tunnels long and deep, the shareholders who travel by it will be so heartily sick, what with foul air, smoke, and sulphur, that the very mention of a railway will be worse than ipecacuanha!!" In 1825 (nine years before that time), the *Quarterly Review* had earnestly trusted that Parliament would, "in all the railways it may sanction, limit the speed to eight or nine miles an hour, which, we entirely agree with Mr. Sylvester, is as great as can be ventured upon with safety!"——Now that we have dipped amongst the prophets, we may remind our readers of one of a somewhat more truthful stamp than the preceding, uttered, too, by a reverend father of the church, as all truthful prophecies might be expected to be. The Rev. Sidney Smith, of facetious memory, predicted that proper means of safety would never be adopted to secure the rescue of railway passengers in cases of extreme peril, especially from fire, until a bishop should happen to be burnt. Now this prophecy or prediction seems to be on the fair way towards fulfilment, inasmuch as no bishop has yet been burnt, and no efficient means, accordingly, have as yet been adopted for the total prevention of such accidents. But will it be credited by those who have not yet been convinced of the fact, that a right reverend bishop who has both stirred up and had to withstand a good deal of the *fire* of red-hot ire in his time, namely, Bishop Philpots, of Exeter, was on Saturday week within an ace of being burnt alive in an incipient *auto da fe*, got up by a "rude fragment of iron irritating by violent and incessant attrition the excitable wood which composed the floor of the carriage," in which his Right Reverend Lordship was seated, on his way to Exeter, and which rude instrument of wrath had "chafed it into a violent heat, which speedily increased till, lo! the fire burst forth, and the wood under the feet of the Right Reverend Bishop was blazing without and intolerable within, where the smoke and burning odour (of the incensed wood of this burning and nearly sacrificial altar) ascended." The Reverend Father in God dashed down the glass, and threw open the doors, and raised his voice, and cried aloud for help; but the terrible shriek of "hell in harness," his own fiery nostrils breathing flame, and the rushing sound of the whirling wheels of the 'express' completely drowned the reverential uproar in the ears of the guards and engineers, who heard not the slightest murmur till it was all but too late. We earnestly hope we shall have no reason to repent that this living sacrifice was not consummated; that a Bishop has not been burnt; and that *now*, at length, as if by anticipation, railway companies will be compelled, as we ourselves have so often insisted, to adopt some means by which passengers may communicate with the guards, and these with the engineer, in cases of emergency,—an appeal to which same effect has just been made in *The Times* newspaper on other grounds, relating indeed to the association with passengers in general of those unfortunate beings—the insane—amongst whom it is a wonder we have not now the melancholy duty to chronicle him who has thus been so providentially "plucked like a brand from the burning."——A point of considerable importance to railway workmen and employers was raised at the last

* "A proposed System for the more ready and correct Valuation of Carpenters' and Joiners' Works, as depending on the Prices and Quantities of Materials used." By H. B. Browning, M.I.B.A. Weale. (Printed in Stamford. A very creditable specimen, by the way, of provincial typography.)

Petty Sessions at Brackley. Mr. H. Friend, a sub-contractor, late on the Oxford and Rugby Railway, was summoned by two labourers for sums alleged to be due to them for work and labour on this railway. Mr. Maley, solicitor for the defendant, argued that the subject was not within the jurisdiction of the magistrates, inasmuch as the case did not come within the act 4th Geo. 4, c. 34. The chairman said, if such was the case, railway labourers were virtually unprotected. The magistrates adjourned the case for a month, and said they should in the mean time obtain counsel's opinion on the subject.——The opening of the Brighton and South Coast Railway, from Havant to Portsmouth, a length of 8 miles, was to take place on Tuesday last. The line has been inspected and approved. On this line, which is nearly a level throughout, the only work requiring notice is the bridge, and its approaches, across the creek at Portsbridge, which has been built in accordance with the wishes of the officers of the Royal Engineers, is flanked by batteries on both sides, and has a magazine connected with it, so arranged as, in case of need, to destroy by explosion the entire bridge and all means of access into the Island of Portsea at that part of it.

NOTES IN THE PROVINCES.

The Windsor Castle and Town Improvement and Removal of Datchet Bridge Bill, which was read the first time in the House of Commons on the 14th inst., will not be further proceeded with this session.——The restoration of the great east window of the chancel of St. Peter's Church, Sudbury, is about to be commenced. The whole frame-work and glass is to be taken out, and the stone-work completely restored with new, from a design by Mr. Sprague, architect, of Colchester, at the expense of Dr. Maclean, patron of St. Gregory's and St. Peter's. During the past winter, an examination of the interior of St. Gregory's chancel was made by the same architect and others, in order to find the piscina and sedilia, but in vain; but shortly after, both were discovered by a bricklayer, who was sent to repair the breaches in the walls, and both are now open to view, after having been enclosed from the time of the Reformation.——The Portland Breakwater is now about to be proceeded with by Mr. Rendall, the engineer, and the land for the fortifications has been surveyed. These works are to be of such an extensive character as must give permanent employment to a great many persons.——The Admiralty have ordered an increase of the wages of the extra-hired labourers of the Portsmouth dockyard from 12s. a week to 14s., in consequence of the high price of provisions.——A Taunton 'Mechanic' has been good enough to draw our attention to the fact of a strike having taken place amongst the Taunton masons and carpenters, but he will find that we had already noticed it in last week's Builder. He also informs us, however, of the result, viz., that "the masons have gained their point (an advance from 16s. to 18s.), but the carpenters only 1s. advance." The credit of these advances, our correspondent gives to "Messrs. Pettit, Pollard, Webber, and Vincent," and how can masters, he asks, who refuse to show a like sympathy with their workmen under the pressure of the present high prices of provisions, "expect them to strain a nerve" in their favour? It may indeed be a question for masters in some cases to consider whether they may not find their workmen willing, as well as able, to repay, or even more than repay, their generosity under present circumstances by this very "straining of a nerve," so significantly hinted at by a 'Mechanic.'——The Unitarians at Taunton intend to build a school, and thoroughly repair their chapel. Plans, adds our correspondent, have been drawn out by Mr. Ingle, architect.——A great number of the limestone getters in the neighbourhood of Dudley have been also 'standing out' for a rise of wages, but they are said to have returned to their work.——The bricklayers' strike at Lincoln, by the way, is now at an end, an advance of 3d. a day having been agreed to.——A very different sort of result has been come to by the nail masters at Dudley, where a meeting of the two classes who pay low wages and high was lately held, for the purpose of making "a new list of workmen's prices, which shall be satisfactory to all parties, and be adopted by the whole of the trade, such prices to be consistent with the present prices of provisions, coal, &c." Only four persons were present, and of these, not one of those who pay low wages. The meeting, thus finding that no sympathy for the workmen was shown by low-priced masters, declared their inability to continue paying the present rate of wages, even although they felt that the present high prices of provisions, coal, &c., demanded at least no reduction. This resolution, however, is of course itself tantamount to a notice to the poor fellows of reduction of their present wages; and what a time this is, to be sure, for reducing wages!——At the recent sale of timber on the estate of the Duke of Marlborough, prices did not average more than 1s. 6d. per foot.——In *The Times* city article, a new project, named the 'Pantdrainiog Quarry Slate Company,' with a capital of 40,000*l.*, for working a new field in the Bangor Slate formation, is favourably noticed. Most of the material is already provided, and the capital includes the purchase of the lease.——That 'monstrous piece of workmanship,' the new landing stage, at Liverpool, was to be tugged to its place, opposite St. George's Pier, on Tuesday last, by seven team-tugs.——After an agitation of nearly two years, the Lincoln Corn Exchange project is at length so far in progress that the plans are drawn, and tenders are advertised for. To the back of the present Cornhill, a three-story building, with Corinthian capitals, is to be erected, containing various public rooms. To the rear is the Corn Exchange, to be lighted from the roof with skylights. On the south side of the newly-laid-out street is to be a covered market, and on the north an open one. The plans and elevations have been prepared by Mr. W. A. Nicholson, the city surveyor. On Monday week, as was announced, the first stone of the New Markets at Doncaster was laid, with masonic honours.——The foundation-stone of the Gateshead Mechanics' Institute was to be laid on Monday last by Mr. William Hutt, M.P.——The proprietor of the Durham Glass Works at Gateshead, Mr. Joseph Price, has undertaken to provide an air-tight bottle, illustrative of the present state of the art of glass-making in England, to be deposited in the foundation-stone of the Institute, with a list in it of the subscribers to the Building Fund, the committee, &c., &c.——The baths projected at Dundee are about to be commenced.——The Dublin Corporation have also resolved to erect baths and wash-houses for the poor.——The Chancellor of the Exchequer, in moving for a further advance of 600,000*l.* from the Consolidated Fund, towards the removal of the destitution of Ireland till next harvest, admitted that "the Public Works Act had been abused by all classes in Ireland. The relief committees, instead of rigidly revising the lists, had only added numbers to numbers, and the consequence was, that upwards of 700,000 persons had been placed on the public works. The Government had found it impossible at first to get persons withdrawn from the public works; and it was not till the 20th of March that it had succeeded in obtaining the forcible reduction of their numbers. By that reduction the Government had got the spring crops sown. The Government had since made another reduction, and he was not sure that it would have been able to make it, if it had not threatened to stop all the works on the 1st of May. The result had been, that the expenditure of the public works had been diminished from the sum of 259,000*l.*, expended weekly in March last, down to 53,000*l.*, expended weekly at present. The new system of relief was now in operation in 1,900 out of 2,050 electoral divisions, and we were now affording 2,253,000 rations a day in Ireland." Meantime the destitute Irish are continuing to shew their gratitude for all these Saxon mercies in their own peculiar way. A check clerk under the Board of Works at Kilkenny was requested the other day by three gentlemen, armed with the official baton of Irish law, viz., the firearm, to contribute his quota to the payment of the enormous debt due by England to Ireland, which was accordingly done to the amount of 15s., or the sum total probably of his week's wages. That he was not required to yield up more than mere money he had reason to be thankful. At Glenfin, in County Derry, an agent of the Board of Works, and agriculturist of an estate, who had made arrangements for expending about 400*l.* or 500*l.* on the property in works, for behoof of the destitute, was attacked a few days since by upwards of a hundred armed men, headed by a man in woman's clothes, and forced to put out his tongue, while they cooly cut away an inch of it!

THE CHARTER-HOUSE, LONDON.

The Charter-house will afford a pleasant and instructive ramble to those who like memorials of the past. Quite apart and distinct from the busy world without, upon "13 acres and 1 rod of land," appropriated by Sir Walter de Manny, of Hainault, as a place of interment for the poor and needy destroyed by the plague in 1349, the present structure stands, including many parts of the earlier buildings which preceded it. "Sir Walter de Manny erected in the present Charter-house-square a chapel for masses on behalf of those who were interred; and it is apparent, from a bull which he obtained of Pope Clement VI., that he had intended to add a college.

In 1361, Michael de Northburgh, Stratford's successor to the bishopric of London, purchased of Sir Walter the whole cemetery, and at his death, on the 9th of September in the same year, bequeathed it, with all his property, for the founding, building, and furnishing a monastery of Carthusians,—an order instituted in 1080, by Bruno, at Chartreux, in the French district of Grenoble.

In 1371, Sir Walter de Manny, with the consent of the then bishop of London, Simon of Sudbury, to whom Michael de Northburgh had left the patronage and care of his foundation, took on him the charge, and founded a monastery of twenty-four Carthusians. He died in 1372, and was buried in the monastery: his funeral being attended by the king and his children, and the barons and prelates of England."

The monastery was surrendered to Henry VIII. in 1537; and after passing through various hands, was purchased in 1611, by Thomas Sutton, a wealthy merchant of London, who obtained letters patent, authorizing him to endow an hospital and school within its precincts.

In illustration of the buildings and foundation, we have now before us two books. One is a folio, entitled *Memorials of Charter-House*, which consists of a series of views drawn and lithographed by Mr. C. W. Radclyffe, and accompanied by brief descriptions, which was published * for little more than private circulation, in 1844, and is now brought before the public. The second is an octavo volume, called *Chronicles of Charter-House*, by a Carthusian, which was issued quite recently.† The latter goes more fully into the history of the monastery and Sutton's noble foundation, and is illustrated by several small etchings.

Over the present porter's lodge is the house formerly occupied by the physicians of the Charter-house. The wooden gates there are the ancient gates of the monastery. The building which stands on the right hand, in the Entrance Court, is thought to be a part of the "fair dwelling" erected by Sir Edward North on the ruins of the monastery, about 1537. The middle court, now called the Master's Court, was also part of North's building. The Long Gallery, which looks into the Entrance Court, was formerly more than 100 feet long, but is now reduced to 45 feet by partitions.

The "Washhouse Court" is one of the few remnants of the old monastery, and will be regarded with interest. The "Preacher's Court" is the most important in appearance. The site of the chapel, from an old plan now in existence, bearing date about the year 1500, seems to be in a great measure identical with that of the monastery. The south wall is probably the oldest portion of the building; but the east wall, now standing, may doubtless lay claim to considerable antiquity: for on the removal of the wainscoting, in the course of repairs which took place in 1842, an old ambrie was discovered towards its south corner. The Ante-Chapel, which, like the Evidence Room above it, has a groined roof, bears the date 1512.

The Great Chamber, or Old Governor's

* By James Moore, Carthusian-street.
† By George Bell, Fleet-street.

Room, appears to have been either built or decorated by Thomas, fourth Duke of Norfolk, between 1565 and 1571, and still preserves much of its original appearance. Its principal ornament is the chimney-piece, which is of wood, and consists of a centre and two wings, in two stories, Tuscan and Ionic. The Great Hall has a curious screen and galleries of the time of Elizabeth.

Both these books will be found interesting, especially to those who owe their education to the valuable institution of which they treat.

Correspondence.

MODEL BATHS AND WASHHOUSES.

SIR,—Your strictures on the want of architectural beauty of the model establishment at Goulston-square are well deserving of general consideration. I fully admit that (as you justly say) "a large sum of money (many thousands) has been spent without the slightest attempt at architectural effect;" but though you candidly say that you "do not make this a charge against the committee," yet it is a charge requiring explanation.

The simple fact is, that the committee have not had a single shilling to spend on what is not, in the direct commercial sense, "useful." Their total expenses, including the purchase of land, will exceed 15,000*l.*; while the subscriptions intrusted to them amount to little more than 10,000*l.* They have been obliged to borrow 5,000*l.* in anticipation of future subscriptions. Under these circumstances, they have been compelled to avoid every expense which was not essential for the efficient working of the establishment.

The committee will rejoice with you, if, in the erection of other baths and washhouses, "the *usefulness* of the *beautiful* be remembered and acted on." If the funds placed at the disposal of the committee had been adequate, not only would they have been saved months of anxious endeavours to reconcile despatch with economy, but they would not have neglected "the beautiful." I may, without want of courtesy, say, that in giving Mr. Baly, "considered simply as engineer," your praise "without qualification," you have expressed as much approbation of the model establishment as the committee could reasonably desire—their chief aim having been to display in their most unpretending building (I cannot admit that it is "ugly") that engineering perfection which will render its working arrangements worthy of being generally followed. They have great reason to hope that their lengthened labours will tend very materially to the saving of time, trouble, expense, and disappointment, wherever similar arrangements are adopted.—I am, Sir, &c.

A MEMBER OF THE PARENT COMMITTEE.
May 28, 1847.

Miscellanea.

BECKFORD LIBRARY AT HAMILTON PALACE.—Mr. Beckford's son-in-law, the present Duke of Hamilton, has built a library at Hamilton Palace (to receive the books collected by Beckford) from the designs of Mr. Goodrich, architect, and the interior artistic embellishments in colour have been executed by Sang. According to a Scotch journal, the style is Greco-Italien, and the plan consists of three avenues meeting in a quadrangle, covered by a dome. The dome is formed by four spandrils, in which are portrayed allegorical figures representing the Sister Arts, while the names of the greatest intellects are emblazoned and decorated in the numerous compartments of the ceiling. Brilliant colours, gold arabesque embellishments, massive pilasters in red granite, and lapis lazuli friezes, are described as producing a fine *ensemble*.

MONUMENT TO CAXTON.—The subscription is proceeding well. Messrs. Clowes have sent 100*l.*, and the Dean and Chapter of Westminster 25*l.* Lord Morpeth will preside at a public meeting in furtherance of the object, on the 12th of June, at the Society of Arts.

PROVINCIAL ARCHÆOLOGICAL MEETINGS.—The Gloucestershire Archæological Association were to hold their annual congress this week, at Cirencester.—The Sussex Archæologists will meet at Chichester, on the 1st of next month.

PROJECTED WORKS.—Tenders have been called for by advertisement for the erection of a chapel at Poplar; a lunatic asylum at Cork; and a school and master's house at Cadby; for altering and repairing a house at King's Langley; for deepening the Buss creek at Southwold, and raising 560 rods of mud wall; erecting a brick wall, and forming drains in Poplar; extending sewers (400 feet) in Mile-end-road; erecting offices, passengers' sheds, and other buildings, at Newhaven harbour on the London, Brighton, and South Coast Railway; executing the works of the London and North-Western branch line from Coventry to Nuneaton; supplying 30,000 larch or baltic sleepers for the York and North Midland line; 4,000 to 5,000 cubic yards of broken Guernsey granite, or other hard stone, for repair of roads in Regent-street, Whitehall, &c., and 2,000 to 2,500 yards of same for Regent's-park-roads; also for supplying 500 tons of new blue Guernsey granite at St. Luke's, Chelsea; and a quantity of British iron and ironmongery to the East India Company; and for enclosing Islington church-yard with wrought iron railing; and painting and keeping in repair the lanterns and fittings of gas lamps in Islington.

NELSON MONUMENT, TRAFALGAR-SQUARE.—On the vote of 2,000*l.*, towards defraying the expense of completing this interminable work, being taken in the Commons the other night, Mr. Brotherton objected to it as a useless work, since he could not approve of the deification of our heroes. Lord Morpeth, in reply to the ever-watchful Mr. Hume, acknowledged that he was afraid the sum now wanted would not finish the monument, as it would only complete 10,000*l.* out of 12,000*l.* estimated to be necessary for that purpose. Indeed, if the original design were carried out, the expense would be 16,000*l.* or 17,000*l.* Mr. Borthwick said he would like to know what design the Government meant to carry out, and asked whether it would not be better to pull down the monument altogether, and erect a respectable one, instead of leaving a structure standing which would proclaim our bad taste to all Europe and to posterity? It savoured of the bad moral taste, as well as of the bad architectural taste of the country, he thought, that a monument to its greatest *naval* hero should have risen so slowly. Yet the metropolis was filled with statues in honour of their great *military* hero, which, indeed, crowded that hero's very windows—things of bronze, which one might worship without breaking the second commandment; for they were like nothing that was in Heaven above, or in the earth beneath, or in the waters under the earth. Perhaps the wisest course would be to take the advice of *Punch*, who thought the best place for them would be where they would least be seen—the Thames Tunnel, for instance. The vote was agreed to.

SHAKESPEARE'S HOUSE.—Shakespeare's house, the house in which the great poet of all time first saw the light, and lived, is to be sold by auction to the highest bidder, and an American show-man threatens to become the purchaser, and cut it up into little morsels for profitable sale. Apart from its positively *holy* character, and regarded simply as a specimen of the English yeoman's habitation of 200 years ago, it would be truly scandalous unnecessarily to destroy it. The Shakespeare Society are interesting themselves in the matter: if it be necessary, a subscription should be commenced; and yet we would not have its vandalic owner too well paid.

CHRIST CHURCH, BATTERSEA, SURREY.—Last week, the first stone of this edifice, which is being erected from the designs of Messrs. Lee and Bury, was laid by the Hon. and Right Reverend the Lord Bishop of Sodor and Man, in the presence of more than two thousand of the inhabitants.

SIR JOHN RENNIE'S CONVERSAZIONE.—On Saturday evening last, Sir John Rennie, as President of the Institution of Civil Engineers, gave the first of two conversazioni, at his house in Whitehall-place. The ground-floor was wholly devoted to the reception of models, and contained a large collection of them.

PROGRESS OF ROMAN CATHOLIC BUILDINGS.—A building fund is being accumulated for the completion of thirteen new Catholic chapels already in the course of erection, and for the building of others.

INDIAN FRESCOES.—The East India Company, according to the *Athenæum*, have received from India copies in oil of part of the remains of the antique fresco paintings in the Bhuddist cave temples of Adjunta, in Kandesh.

HEALTH OF TOWNS BILL.—The Government propose to go into committee on this bill, on Monday, the 14th inst. A number of petitions in favour of it have recently been presented.

TO CORRESPONDENTS.

"*Constant Reader.*"—The ledges are included in the price, and are not measured separately—except when analyzing a door to get at a price per foot. The ground work should be cubed.

"*G. J. W.*"—Shall hear from us.

"*F. A.*"—We cannot afford the space.

"*M. W.*"—The reference alluded to was not meant in any way offensively.

"*H. M.*"—The *right* is always the best course.

"*W. D.*"—A correspondent says he has invented a self-acting trap for guley-drains. We cannot advise him how to dispose of it.

"*Ventilating Panes.*"—144, Strand.

Received.—"R S." "C. B." "S. P. S." "A Subscriber," "B. B." "W. E." "G. S." "Messrs. W." "A Competitor," "Monumental Brasses and Slabs: an Historical Notice of the incised Monumental Memorials of the Middle Ages," by the Rev. Chas. Boutell, M.A. (G. Bell, Fleet-street. Thos. Parker, Oxford, 1847.) "The Tradesman's Book of Ornamental Designs," by S. Leith. No. 1. (Orr, Paternoster-row.) "Address of the Council of the People's International League." "Reporton the Ventilation of the School-Houses of Boston."

"*Books, Prices, and Addresses.*"—We have not time to point out books or find addresses.

ADVERTISEMENTS.

ROYAL ACADEMY of ARTS, Trafalgar-square.—The Exhibition of the Royal Academy is now open. Admission (from Eight o'clock till Seven), One Shilling; Catalogue, One Shilling. JOHN PRESCOTT KNIGHT, R.A., Dep. Sec.

THE NEW PALACE AT WESTMINSTER.—DEDICATED TO HER MOST GRACIOUS MAJESTY.
Shortly will be Published, by Subscription, two highly-finished and effective Views of the Interior of the

NEW HOUSE OF LORDS, to be executed in the very best style of Tinted Lithography, by Messrs. DAY and HAGHE, Lithographers to the Queen, from very beautiful Water-colour Paintings, by Artists of eminence. The views are taken by the express permission of CHARLES BARRY, Esq. In announcing the publication of the above Views, the Publisher pledges himself to produce the Lithographs in the very highest style of the art, so as to render them worthy of the noble national edifice they are intended to illustrate.
Size of the prints, 23 in. by 30 in. Price of the pair, plain, 3*l.* 3*s.*; coloured, in exact imitation of the drawings, and mounted, 4*l.* 4*s.*
London: Published by WILLIAM DAY, 17, Gate-street, Lincoln's-Inn-fields.

TO ARCHITECTS AND LOVERS OF THE FINE ARTS.
OF the lately deceased Director of the Bavarian Royal Academy of Arts, and Director-General of the Plastic Building Monuments of the kingdom of Bavaria, knight, FREIDRICH VON GAERTNER, there are still some original specimens of Monuments in Sicily, lithographed by himself on stone, on hand and for sale. As F. von Gaertner, during his stay in Sicily, has measured and drawn on the spot himself on stone, these rare remains of the old Greek School of Architecture. The original drawings of this great Architect must be considered of great value to all Architects and Lovers of the Art, the more so as there is only twenty more editions of the same on hand, and the plates not being any more in existence.
This ARCHITECTURAL WORK of the Monuments of Sicily consists in two title pages, ten well-executed drawings in tan print, and six measurements, with German and French text, on vellin royal paper.
The drawings are:—1. Temple of Concordia, at Agrigent; 2. Temple of Juno Lucina, at the same place; 3. Ruins of the Temple of Jupiter; 4. Theron's Tomb, at Agrigent; 5. Temple of Segesta; 6. Remains of the Temple of Jupiter, at Selinus; 7. Old Tomb Street, at Syracuse; 8. Antique Stone Quarry, at Syracuse; 9. Remains of Theatre, in Taormina; 10. The so-called Dionisius-Ear. The six plates of measurements belonging to same are particularly exact, the whole work most elegantly got up, systematically arranged, and must be a treasure and of great interest to any Architect and Lovers of the Old School of Architecture.
The price of a complete, well-preserved edition of this valuable work is 6*l.*, deliverable at Hamburgh. C. F. ZELLERS, in Munich.
Orders for this work are attended to by Mr. R. REINHAUER, in Hamburgh.

BRITISH MUTUAL LIFE OFFICE.—The Public are invited to examine for themselves the advantages gained for Assurers by the plan on which policies are granted by this Office.—Apply to CHARLES JAMES THICKE, Secretary, 17, New Bridge-street, Blackfriars.

MUTUAL LIFE ASSURANCE, ANNUITIES, &c. The INDUSTRIOUS CLASSES may effect Assurances on Life for 20*l.* and upwards. Annuities for themselves in Old Age, or for their Widows, and Endowments for Children. Premiums may be paid Quarterly or Monthly. Assurers will have the security of a Guarantee Fund.
Apply personally, or by letter, to R. W. MORRIS, Actuary to the Medical, Legal, and General Mutual Life Assurance Society, 126, Strand, London.—Agents wanted.

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In addition to Assurances on Healthy Lives, this Society continues to grant Policies on the Lives of Persons subject to Gout, Asthma, Rupture, and other Diseases, on the payment of a premium proportioned to the increased risk. The plan of granting Assurances on Invalid Lives originated with this Office in the beginning of 1824.

TABLE OF PREMIUMS FOR ASSURING 100*l.* ON A HEALTHY LIFE.

Age.	For Seven Years, at an Annual Payment of	For Fourteen Years, at an Annual Payment of	Life Rate.
	£. s. d.	£. s. d.	£. s. d.
30	1 4 1	1 6 1	2 10 4
35	1 7 2	1 9 3	2 16 6
40	1 10 4	1 13 6	3 3 8
45	1 14 8	2 1 0	3 13 0
50	2 3 0	2 13 11	4 7 3
55	3 0 14	3 13 3	5 5 0
60	4 2 3	5 1 1	6 7 2
65	5 16 3	6 19 11	7 16 9

Every description of Assurance may be effected with this Society, and Policies are granted on the Lives of Persons in any station, and of every age.
BONUSES.—The two first divisions averaged 22*l.* per cent. on the Premiums paid. The Third, 26*l.* per cent. The FOURTH Bonus, declared January 1847, averaged rather more than 26*l.* per cent.; and, from the large amount of profit already realized, which has been reserved for future appropriation, and other causes, the Bonuses hereafter are expected considerably to exceed that amount.
The Society's Income, which is steadily increasing, is now upwards of 116,000*l.* per annum.
GEO. H. PINCKARD, Actuary.
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BOWIE'S Glass Ventilating Pane, for the Admission of Fresh Air without any unpleasant or dangerous draught, and the escape of respired or vitiated air.—Specimens to be seen and orders taken at 148, Strand, near Somerset House.

DUTY OFF ORNAMENTAL WINDOW GLASS.

CHARLES LONG begs to inform his Friends and the Public, that he can now supply Ornamental Glass from 1s. 3d. per foot superficial; and borders from 3d. per foot, run; and having just built two of the largest kilns in London, is enabled to execute extensive orders with unprecedented dispatch.—1, King-street, Portman-square.—Terms, Cash only.

THOS. MILLINGTON, 87, Bishopsgate-street Without, has a large Stock of Crown Glass on hand of the following sizes:—10 by 8, 9 by 7, 8 by 6, at 3d. per foot. Every description of Window Glass.

FOREIGN WINDOW GLASS, superior to English, 16 ounces to the foot, suitable for general purposes, in cases of 200 feet, for 43s., or about 2½d. per foot, in large dimensions; smaller do., in 100 feet cases, at 2½d. per foot. No less than a case can be had at these prices, and the order must be accompanied with a remittance.—THOS. MILLINGTON, 87, Bishopsgate-street Without.

COLOURED WINDOW GLASS, equal to the Antient.

Ruby in Sheets, a splendid colour, per foot	2s. 3d.
Green	1 3
Blue	1 0
Purple	1 0

Glass Engraved to any Design.—JOHN MILLINGTON, 87, Bishopsgate-street Without.

SOHO PLATE GLASS WAREHOUSE, 26, SOHO SQUARE.—A. GOSLETT begs to inform Builders and the Trade generally, that he is prepared to contract for the supply of any quantity of Belgian 21 and 16 oz. Sheet Glass, either cut to sizes or in 100 and 200 feet cases, delivered free in London. Having a large stock on consignment at his Warehouse, he begs the favor of an inspection; he has also just received a few cases of very fine ruby and other coloured sheet glass at very low prices.

SOHO PLATE GLASS WAREHOUSE, 26, SOHO-SQUARE, depot for the sale of the PLATE GLASS manufactured by the St. Gobain and St. Quirin and Cirey Companies, Paris. The attention of Architects, Builders, and the Trade generally is particularly requested to this article, which stands UNRIVALLED FOR BRILLIANCY OF COLOUR, superiority of substance and polish, and possessing almost faultless quality. This Plate Glass can be procured of any dimensions.—Applications for samples, lists of prices, and all further particulars, to be addressed to ALFRED GOSLETT, Agent, 26, Soho-square.

THE UNION PLATE GLASS Company beg to call the attention of Architects, Builders, and the Trade generally to their extensive stock of Glass, which stands unrivalled for colour and quality; and having considerably enlarged their Manufactory, are now enabled to execute orders to any extent with the greatest despatch.

N.B. Rough Plate Glass supplied, one-fourth, three-eighth, one-half, and three-quarter-inch thick.

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CROWN GLASS, in Crates of Eighteen Tables, at the following low prices, for ready money:—

Crown Glass cut to size from one foot upwards, at 3d. per foot.	£. s. d.	Squares of Small Crown Glass, at 1d. 1½d., 2d. and 2½d. per foot.
	Thirds 4 4 0	
	Fourths 3 10 0	
	C.C. 3 8 0	
	C.C.C. 3 0 0	

SHEET GLASS of all descriptions equally low.—White Lead, Oil, Turps, Colours, and Varnishes, at WILLIAM FREDERICK FENTON'S Window Glass, Lead, Oil, and Colour Warehouse, 28, West Smithfield, London.

HERRING'S PATENT SAFETY WINDOW.—No invention ever offered the advantages to builders and the public; it will positively add 5 to 10 per cent to all houses having it; repay the cost every two years; abolish all danger to life and limb, cleaning and repairing. It is in full operation (four different ways), forms a complete ventilator and sun-blind; all simple, cheap, and effective.—Apply for licences, and to inspect its real merits, to HERRING'S Patent Steam Bed-Feather Factory, 14, Kingsgate-street, London.

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MANUFACTURER

of Sashes and Frames, and Joiner to the Trade, 181, Bunhill-row, Finsbury-square.—Well-seasoned materials, superior workmanship, lowest prices.—Upwards of 400 DOORS, and a large variety of Sashes and Frames, always on sale. Glazed goods securely packed for the country. Steam-struck Mouldings in any quantity.—N.B. This Establishment is worth the notice of all engaged in building.

WALLIS'S PATENT LIQUID WOOD KNOTTING.—This newly-discovered Liquid Composition, which Messrs. Geo. and Thos. Wallis have the satisfaction of introducing to the Trade, possesses the important qualification of effectually stopping Knots in Wood, however bad, and preventing them coming through and disfiguring the paint above.

Many substances have been used and much time spent in endeavouring to find a sure for a bad Knot, but hitherto without success. Messrs. Wallis therefore feel much pleasure in offering to the public an article so long and anxiously called for.

In the application, skill is not required; it is put on to the work with a brush like common paint, can be used in all climates and situations, and does not require heat.

Sold wholesale and retail, by Messrs. G. and T. Wallis, Varnish, Japan, and Colour Manufacturers, No. 24, Long Acre.

TODD'S PATENT PROTOXIDE PAINT manufactured by CHAS. FRANCIS and SONS, CEMENT WORKS, NINE ELMS, LONDON.

The properties of this Paint are peculiar for preventing iron from oxidation, wood from decay, and masonry from damp; it neither cracks nor blisters with the hottest sun, and is therefore most valuable for Railways, Boilers, Glass, Gas, and Water-tubes; Hothouses, Forcing-houses, and for Shipping. Its adhesion is so great to iron and wood, that the hardest friction will scarcely remove it. It prevents vegetation on stuccoed buildings, and is not affected by spray of sea-water.

PROTOXIDE PAINT is sold ground in oil, and, compared with white-lead, its property of concealing is as 70 to 50, so that one hundred weight is equal to one and a half of lead. It works well under the brush, and forms with oil an unctuous and cohesive mixture. If blended with other paints it has a softer tone than white-lead. For houses painted during occupation, it is most preferable, being perfectly innocious.

STEPHENS'S PROCESS for DYEING or STAINING WOOD, as a substitute for Paint. The natural grain of wood is imitated by art, but the most successful imitation has a sameness of appearance when compared with the continual variety which different woods present in their natural grain. To give an ornamental colour to the wood without obscuring the grain, is the object of this process, which surpasses paint in appearance, while at the same time it is so economical that the whole interior of a house, which would take a month or six weeks to paint in the usual manner, may be finished in one week by the process above named, and be more durable when finished. The process is strictly approved and sold by HENRY STEPHENS, 87, Blandford-street, Manchester-square, W., also 13, Castle-st. Holborn, and 58, Fenchurch-street, E.C. Any colour may be obtained in powder at 6s. per pound, which dissolving in water to form the ground, and one pound will make one gallon of stain.—N.B. To the Trade supplied.

Sold also at the office of "THE BUILDER," 2, York-street, Covent Garden, London.

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A Considerable saving will be effected in the purchase of IRONMONGERY, by applying at F. B. WILLIAMSON'S Wholesale Warehouse, No. 5, Chiswell-street, Finsbury-square, near Whitbread's Brewery.

Best Patent Cut Clasp.

2d.	4d.	6d.	8d.	10d.	2s.
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Best Patent Sash Line.

1	2	3	4	5	6
4s. 2d.	5s.	6s. 6d.	7s. 6d.	10s.	12s. per gross.

Elliptic Stoves, 2d. per inch. Registers, 6d., 7d., 8d., per inch.
Self-acting Kitchen Ranges, with Oven and Bank Boiler.
Wrought Bars and Bright Fittings.

2 ft., 23s.	2 ft. 3 in., 25s.	2 ft. 6 in., 27s.	2 ft. 9 in., 30s.	3 ft., 34s.

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Strong Self-acting Kitchen Ranges, with Back Boiler and Oven, and Wrought Bars:—

2 ft.	2 ft. 3 in.	2 ft. 6 in.	2 ft. 9 in.	3 ft.
£2. 2s.	£2. 12s.	£2. 16s.	£3.	£3. 10s.

Henly's Patent Improved, with back Boiler and Wrought Iron Oven:—

2 ft.	2 ft. 3 in.	2 ft. 6 in.	2 feet 9 in.	3 ft.
£2.	£2. 12s.	£2. 15s.	£3. 10s.	£4.

Best Registered Stoves, at 7d., 8d., and 9d. per inch.
Do. Elliptic do., at 3½d., and 4d. do.

Manufacturer of WOLFASTON'S PATENT REGISTER STOVES, a certain cure for SMOKY CHIMNEYS, and effecting a great saving in fuel. To be seen in use daily.

Orders from the Country, accompanied with a remittance or reference, will meet with prompt attention.

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PIERCE respectfully invites the attention of the Nobility, Gentry, and Architects, who are building or re-fitting up Mansions, to his novel and unique display of STOVE GRATES, FENDERS, and IRONS, in suites, which are now on view at his Show Rooms. By employing first-rate Artists, he is enabled to guarantee that every work entrusted to him will be finished in the best manner, and the purest style of Architecture required; being manufactured on the premises, guided by his practical experience of more than thirty years devoted to the WARMING and VENTILATION of APARTMENTS, Public Buildings, and Private Mansions, to numbers of which he can refer for the perfect success of his arrangements.

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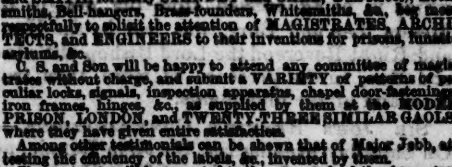

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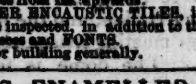

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